

Jaunos al lado de la folded
SL8 / YBCO / LCMO C/Mac = SL8

YBCO1 - Ok edge en carb YBCO
 en Cap YBCO

YBCO2 - otro y \rightarrow Todos tienen H_u
 \rightarrow YBCO tiene columna
 \rightarrow Se ve muy bien el borde de YBCO

YBCO3 = como \rightarrow Vans SL8 SL8
 Siempre sobre YBCO
 C/Mac data

29-4-03
 Cerramos de muestra
 a SLYM 23
 la muestra ha sido puesta

- C/Mac / SLYM 23
 - Almacén, enfriar T = -179.5 °C

Fig. 5: A scan from Varela's logbook dated 29/04/2003 showing data recorded for sample SL8, a nominal [YBCO₁/LCMO₁₅] superlattice, on April 28th. The next day sample SLYM23 was loaded and a temperature of -179.5°C was recorded.

The data obtained in Chicago were in fact incorporated into an early draft of the paper, as shown in Fig. 6. However, the 100K data showed no significant difference from the room temperature data, and were therefore removed from the first submission of this work, which was made to *Physical Review Letters* in August 2004.

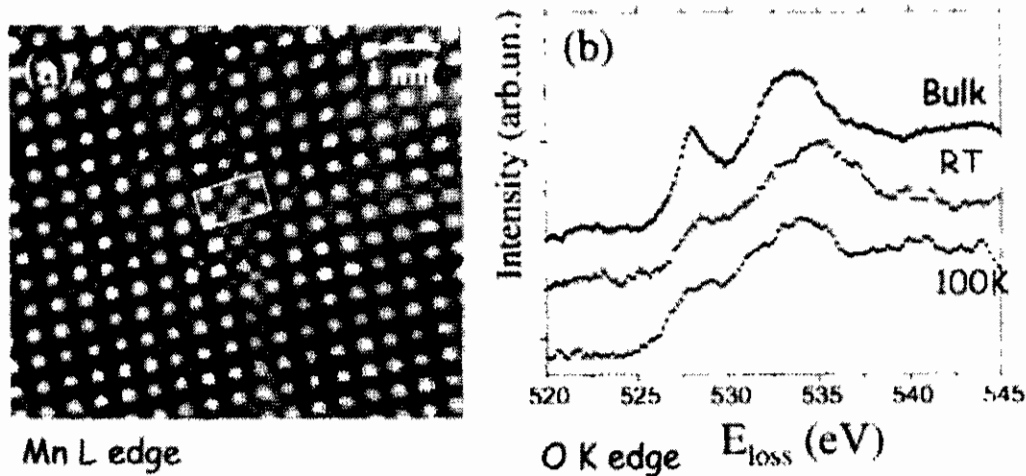


Fig. 6: Part of a figure from an early draft showing the 100K data obtained in Chicago for the $[\text{YBCO}_1/\text{LCMO}_{15}]$ superlattice, which was later removed in the version submitted to *Physical Review Letters*.

It seems unusual to assume that data do not exist simply because they are not shown. With a phone call or email we could have sent the original figure containing the low temperature data.

Muller goes on to question the existence of samples, referring to the $[\text{YBCO}_{10}/\text{LCMO}_{15}]$ superlattice as “fictional” in the PowerPoint file. More recently, in a 55-page document, Silcox and Muller say “At the 2007 Spring MRS Meeting, Varela (both orally and in a slide presented in talk L8.3) claimed measurements at low temperature still needed to be done.” Figure 7 shows one of the slides presented by Varela at that meeting which shows an image and EELS data for such a supposedly fictional superlattice. This sample is also a nominal $[\text{YBCO}_{10}/\text{LCMO}_{15}]$ superlattice, but originating from a different growth run, sample SLYM139.

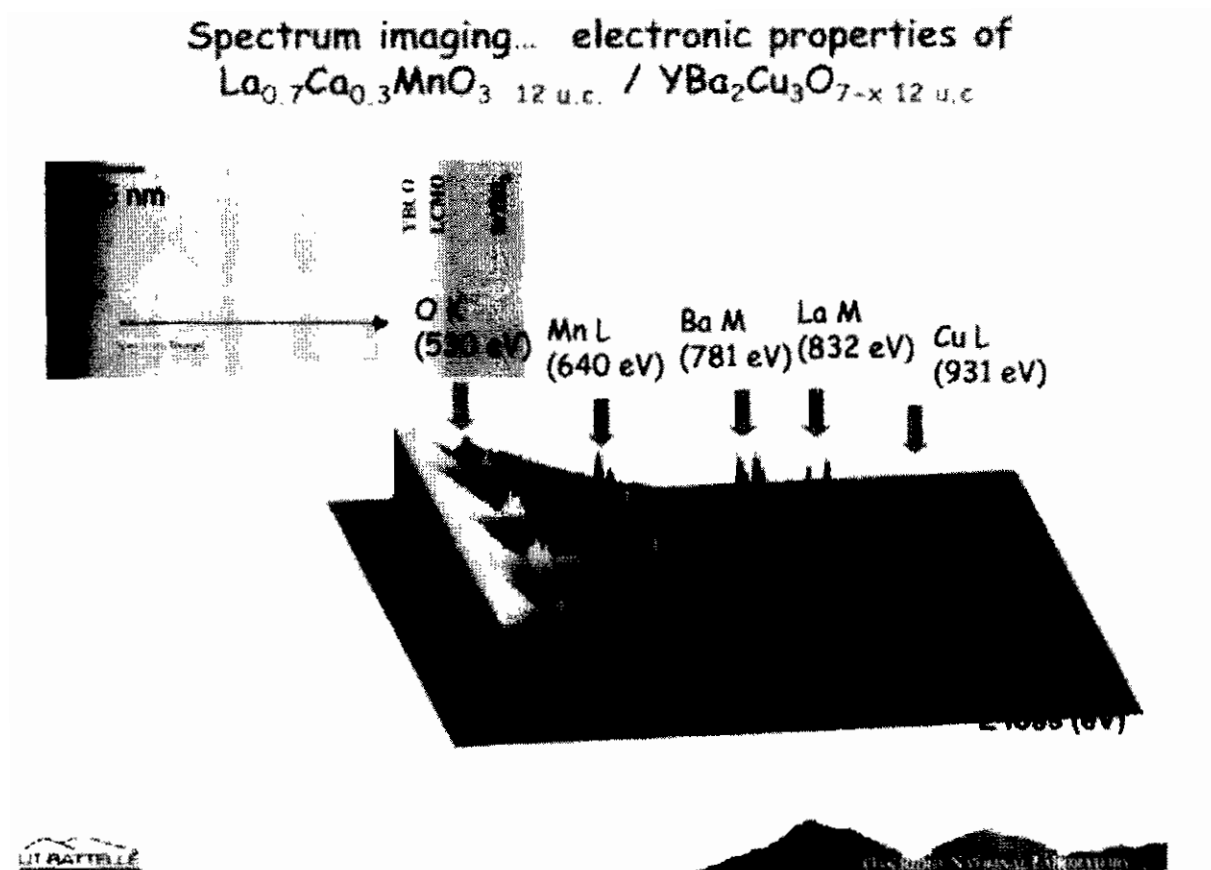


Fig. 7: A slide presented by Varela at the 2007 Spring MRS Meeting showing a superlattice claimed by Muller to be fictional. Upper left is the image recorded in the STEM, and lower right is EELS data recorded in the direction of the red arrow (from the green rectangular region) showing several different peaks.

In the slide the superlattice is labeled $\text{LCMO}_{12 \text{ u.c.}} / \text{YBCO}_{12 \text{ u.c.}}$. In the slide, the *actual* average superlattice periodicity was quoted, as determined from Z-contrast images. In the previous preprints we referred to the *nominal* periodicity expected from the deposition times during sputter deposition, as usually done in the absence of better microstructural evidence, which was $\text{LCMO}_{15 \text{ u.c.}} / \text{YBCO}_{10 \text{ u.c.}}$.

Muller claims Varela admitted at the MRS meeting that measurements at low temperature still needed to be done. This is partially true, the Chicago data for this sample was not ideal because the sample was drifting too much. Therefore, the intended context of Varela's comment was **further** measurements at low temperature still needed to be done.

Damage threshold for Hi Tc superconductors

In a *Nature Materials* News and Views article [4], it is stated that spectroscopy data from superconductors in a recent *Nature* paper [5] involved “*electron doses that exceed by tenfold the damage threshold.*” As Muller understands, it is the oxygen pre-peak that is used to quantify holes in superconductors. Exceeding the damage threshold by 10 times

would result in no quantifiable prepeaks at all, so therefore the accusation amounts to one of data fabrication.

Below we present the raw data, free from damage artifacts, along with the extensive tests carried out to ensure the data were collected below the damage threshold.

Figure 8 presents page 226 from Varela's logbook (mostly in Spanish) with blue outlined comments translated, showing that R. Klie's sample with Ca was loaded into the microscope on June 7th, 2004, dates that coincide with a visit to ORNL by R. Klie. Figure 9 shows page 229 from Varela's logbook, containing comments on acquiring EELS from several dislocation cores with a static beam, and an explicit test for damage by increasing the beam current using the gun lens. The conclusion was the cores damage very slowly but the next page (Fig. 10) shows the beam current was restored to the prior (lower) level in order not "to burn the sample." The record shows that Varela was perfectly aware of the beam damage issue and checked to be sure there was no significant damage.

226

06/08/04

SU4652

HB603

manus en

C/Man / SU4652

6/9/4 manus k61

→ pet. ash Tiv : Ca

kaunas kashuan

→ unarmored

Kellie Griffin

C/Man / k61

6/7/04

Manus R. Klie in Ca

Sample of R. Klie with Ca

WIV : 98 As

→ algues foto

Fig. 8: Page 226 from Varela's logbook (in Spanish) with blue outlined comments translated, showing that R. Klie's sample with Ca was loaded into the microscope on June 7th, 2004.

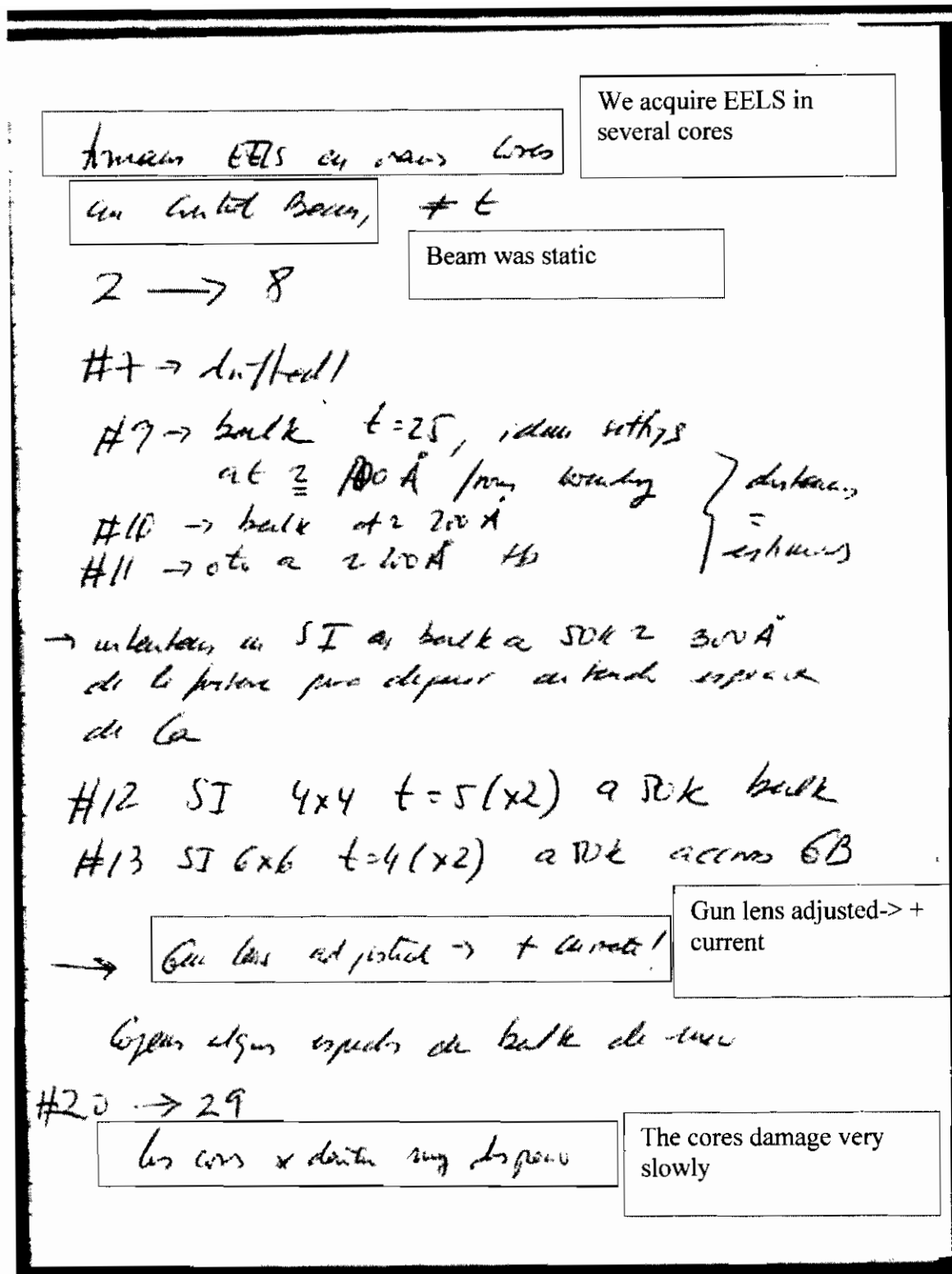


Fig. 9: Page 229 from Varela's logbook, containing an explicit test for beam damage by increasing the beam current using the gun lens. The conclusion was the cores damage very slowly.

2009
5/27/09

→ After a gun lens 1 click
below max

Back to gun lens 1 click
down

in gun lens 1 click down sample

We do not want to burn
the sample

#30 → new gun lens
Back, turn on a 100k
t=5

#33 → core bright column t=5 a 1M

#34 → another bright column t=5 a 1M

Most likely this is where
the data collection started,
identifying the various
columns as DC1 etc

Let amplifier scans are

B₁ B₂ B₃
x cp
x DC1
x DC2

#36 EES line CP t=5

#41 → BE

#48 → DC1

→ Gun lens F dispersion a 0.2 v/ch

#70 → ZL t=0.05 x 5

→ Back L t=20 min core

Fig. 10: The beam current was restored to the prior (lower) level in order not "to burn the sample."

It was not until June 10th that the published data were collected. Figure 11 presents screenshots of the folders containing the High Tc data, 183 Mbytes of it, and the folder "Ca-doped 06-10-04" that contains the files corresponding to the increase and decrease of the gun lens.

Name	Date Modified	Size	Kind
Ca doped	Dec 14, 2007, 12:25 PM	--	Folder
Ca doped 06-10-04	Dec 14, 2007, 12:25 PM	--	Folder
YBCO4	Dec 14, 2007, 12:24 PM	--	Folder
YBCO4 07-14-04	Dec 14, 2007, 12:24 PM	--	Folder
1_HAADF_1M_general.dm3	Jul 14, 2004, 10:32 AM	2.1 MB	DM3 File
1_LAADF_1M_general.dm3	Jul 14, 2004, 10:33 AM	2.1 MB	DM3 File
2_HAADF_1M_general.dm3	Jul 14, 2004, 10:44 AM	2.1 MB	DM3 File
2_LAADF_1M_general.dm3	Jul 14, 2004, 10:45 AM	2.1 MB	DM3 File
3_HAADF_2M_general.dm3	Jul 14, 2004, 10:45 AM	664 KB	DM3 File
3_LAADF_2M_general.dm3	Jul 14, 2004, 10:46 AM	664 KB	DM3 File
4_HAADF_2M_general.dm3	Jul 14, 2004, 10:48 AM	664 KB	DM3 File
4_LAADF_2M_general.dm3	Jul 14, 2004, 10:48 AM	664 KB	DM3 File
5_HAADF_1M_big mask.dm3	Jul 14, 2004, 10:50 AM	664 KB	DM3 File
5_LAADF_1M_big mask.dm3	Jul 14, 2004, 10:50 AM	664 KB	DM3 File
6_HAADF_2M_big mask.dm3	Jul 14, 2004, 10:51 AM	664 KB	DM3 File
6_LAADF_2M_big mask.dm3	Jul 14, 2004, 10:51 AM	664 KB	DM3 File
7_HAADF_50k_big mask.dm3	Jul 14, 2004, 10:53 AM	2.1 MB	DM3 File

Name	Date Modified	Size	Kind
57_EELS_core_BC_tw5_1M.dm3	Jun 10, 2004, 4:02 PM	92 KB	DM3 File
53_EELS_core_DC2_tw5_1M.dm3	Jun 10, 2004, 3:51 PM	92 KB	DM3 File
51_EELS_core_DC3good_tw5_1M.dm3	Jun 10, 2004, 3:51 PM	92 KB	DM3 File
52_EELS_core_DC2_tw5_1M.dm3	Jun 10, 2004, 3:51 PM	92 KB	DM3 File
49_EELS_core_DC1_tw5_1M.dm3	Jun 10, 2004, 3:45 PM	92 KB	DM3 File
50_EELS_core_DC1_tw5_1M.dm3	Jun 10, 2004, 3:44 PM	92 KB	DM3 File
40_EELS_core_CP_tw5_1M.dm3	Jun 10, 2004, 3:42 PM	92 KB	DM3 File
48_EELS_core_BC_tw5_1M.dm3	Jun 10, 2004, 3:42 PM	92 KB	DM3 File
41_EELS_core_CPgood_tw5_1M.dm3	Jun 10, 2004, 3:42 PM	92 KB	DM3 File
45_EELS_core_BC_tw5_1M.dm3	Jun 10, 2004, 3:42 PM	92 KB	DM3 File
46_EELS_core_BL_tw5_1M.dm3	Jun 10, 2004, 3:42 PM	92 KB	DM3 File
38_EELS_core_DC1_tw5_1M.dm3	Jun 10, 2004, 3:42 PM	92 KB	DM3 File
47_EELS_core_BCgood_tw5_1M.dm3	Jun 10, 2004, 3:39 PM	92 KB	DM3 File
44_EELS_core_BC_tw5_1M.dm3	Jun 10, 2004, 3:36 PM	92 KB	DM3 File
42_EELS_core_BC_tw5_1M.dm3	Jun 10, 2004, 3:35 PM	92 KB	DM3 File
43_EELS_core_BL_tw5_1M.dm3	Jun 10, 2004, 3:29 PM	92 KB	DM3 File
39_EELS_core_CP_tw5_1M.dm3	Jun 10, 2004, 3:27 PM	92 KB	DM3 File
37_EELS_core_CP_tw5_1M.dm3	Jun 10, 2004, 3:25 PM	92 KB	DM3 File
36_EELS_core_CP_tw5_1M.dm3	Jun 10, 2004, 3:25 PM	92 KB	DM3 File
35_EELS_core_CP_tw5_1M.dm3	Jun 10, 2004, 3:21 PM	92 KB	DM3 File
34_HAADF_50k_tw5_1M.dm3	Jun 10, 2004, 3:07 PM	1.2 MB	DM3 File
33_HAADF_50k_tw5_1M.dm3	Jun 10, 2004, 2:57 PM	1.2 MB	DM3 File
32_EELS_core bright column bulk 1M_tw5.dm3	Jun 10, 2004, 2:56 PM	92 KB	DM3 File
31_EELS_core bright column bulk 1M_tw5.dm3	Jun 10, 2004, 2:43 PM	92 KB	DM3 File
30_EELS_core bright column bulk 1M_tw5.dm3	Jun 10, 2004, 2:43 PM	92 KB	DM3 File
29_EELS_core bright column bulk 1M_tw5.dm3	Jun 10, 2004, 2:43 PM	92 KB	DM3 File
28_EELS_core bright column bulk 1M_tw5.dm3	Jun 10, 2004, 2:43 PM	92 KB	DM3 File
27_EELS_core bright column bulk 1M_tw5.dm3	Jun 10, 2004, 2:43 PM	92 KB	DM3 File
26_EELS_core bright column bulk 1M_tw5.dm3	Jun 10, 2004, 2:43 PM	92 KB	DM3 File
25_EELS_core bright column bulk 1M_tw5.dm3	Jun 10, 2004, 2:43 PM	92 KB	DM3 File
24_EELS_core bright column bulk 1M_tw5.dm3	Jun 10, 2004, 2:43 PM	92 KB	DM3 File
23_EELS_core bright column bulk 1M_tw5.dm3	Jun 10, 2004, 2:43 PM	92 KB	DM3 File
22_EELS_core bright column bulk 1M_tw5.dm3	Jun 10, 2004, 2:43 PM	92 KB	DM3 File
21_EELS_core bright column bulk 1M_tw5.dm3	Jun 10, 2004, 2:43 PM	92 KB	DM3 File
20_EELS_core bright column bulk 1M_tw5.dm3	Jun 10, 2004, 2:43 PM	92 KB	DM3 File
19_EELS_core bright column bulk 1M_tw5.dm3	Jun 10, 2004, 2:43 PM	92 KB	DM3 File
18_EELS_core bright column bulk 1M_tw5.dm3	Jun 10, 2004, 2:43 PM	92 KB	DM3 File
17_EELS_core bright column bulk 1M_tw5.dm3	Jun 10, 2004, 2:43 PM	92 KB	DM3 File
16_EELS_core bright column bulk 1M_tw5.dm3	Jun 10, 2004, 2:43 PM	92 KB	DM3 File
15_EELS_core bright column bulk 1M_tw5.dm3	Jun 10, 2004, 2:43 PM	92 KB	DM3 File
14_EELS_core bright column bulk 1M_tw5.dm3	Jun 10, 2004, 2:43 PM	92 KB	DM3 File
13_EELS_core bright column bulk 1M_tw5.dm3	Jun 10, 2004, 2:43 PM	92 KB	DM3 File
12_EELS_core bright column bulk 1M_tw5.dm3	Jun 10, 2004, 2:43 PM	92 KB	DM3 File
11_EELS_core bright column bulk 1M_tw5.dm3	Jun 10, 2004, 2:43 PM	92 KB	DM3 File
10_EELS_core bright column bulk 1M_tw5.dm3	Jun 10, 2004, 2:43 PM	92 KB	DM3 File
9_EELS_core bright column bulk 1M_tw5.dm3	Jun 10, 2004, 2:43 PM	92 KB	DM3 File
8_EELS_core bright column bulk 1M_tw5.dm3	Jun 10, 2004, 2:43 PM	92 KB	DM3 File
7_EELS_core bright column bulk 1M_tw5.dm3	Jun 10, 2004, 2:43 PM	92 KB	DM3 File
6_EELS_core bright column bulk 1M_tw5.dm3	Jun 10, 2004, 2:43 PM	92 KB	DM3 File
5_EELS_core bright column bulk 1M_tw5.dm3	Jun 10, 2004, 2:43 PM	92 KB	DM3 File
4_EELS_core bright column bulk 1M_tw5.dm3	Jun 10, 2004, 2:43 PM	92 KB	DM3 File
3_EELS_core bright column bulk 1M_tw5.dm3	Jun 10, 2004, 2:43 PM	92 KB	DM3 File
2_EELS_core bright column bulk 1M_tw5.dm3	Jun 10, 2004, 2:43 PM	92 KB	DM3 File
1_EELS_core bright column bulk 1M_tw5.dm3	Jun 10, 2004, 2:43 PM	92 KB	DM3 File

Fig. 11: Screenshots showing the High Tc data. The upper image shows four folders and the lower image shows the contents of the folder "Ca-doped 06-10-04" with the files corresponding to the increase and decrease of the gun lens.

Figure 12 presents two sample spectra from dislocation cores. The oxygen pre-peak is clearly seen in both (arrowed) showing that significant damage had not occurred. The beam currents did not exceed the damage threshold.

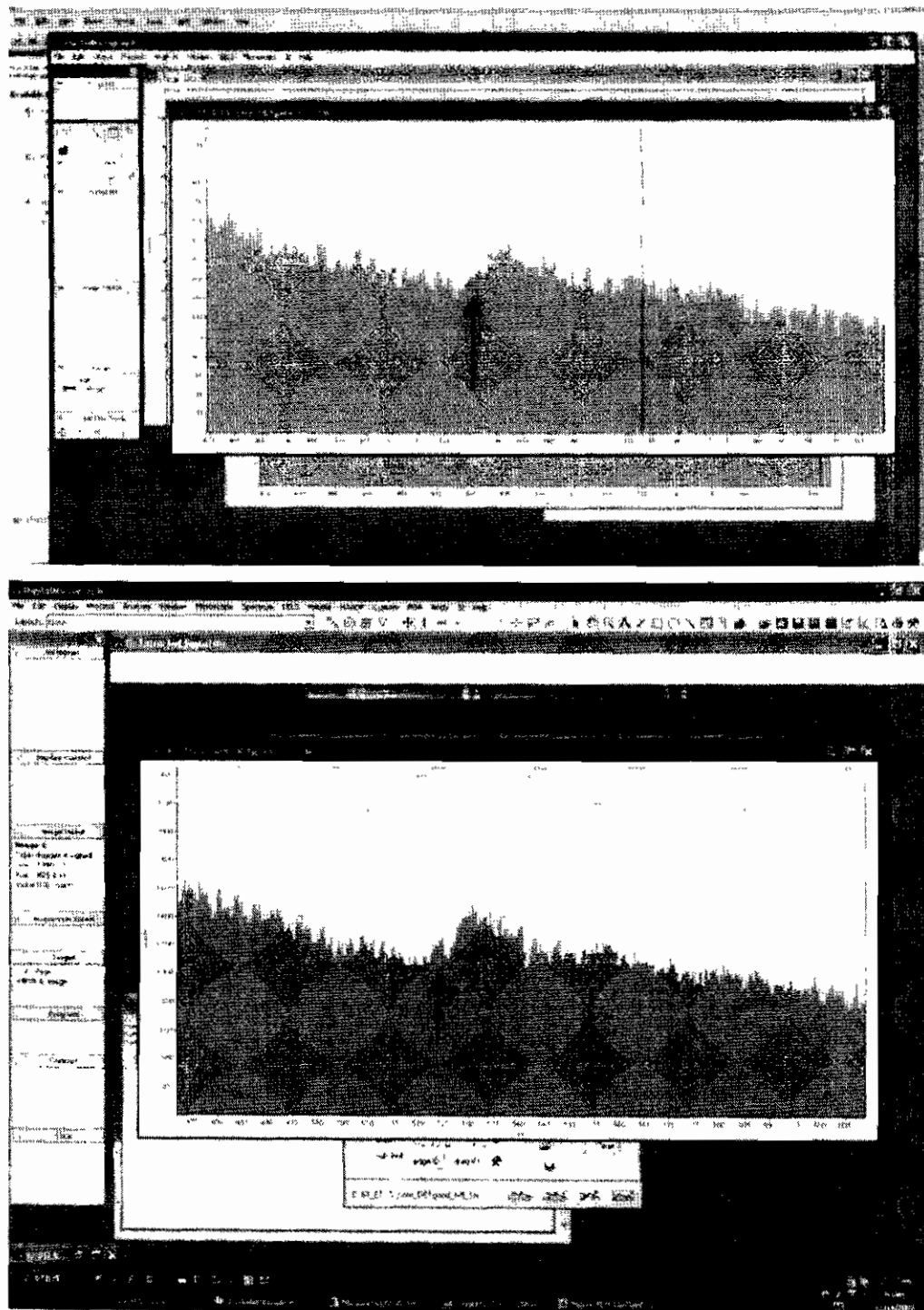


Fig. 12: Two sample spectra from dislocation cores. The oxygen pre-peak is clearly seen in both (arrowed) showing that significant damage did not occur.

The data are noisy, which was why spectra from each column presented in the *Nature* paper were averaged over five dislocation cores. All dislocation cores had the same structure, and the averaging was clearly stated in the Methods section of the paper. Furthermore, in the Ca-doped core, hole concentrations were found that were at or near bulk values, which also excludes the possibility of significant damage having occurred at the grain boundary.

It is illuminating how Muller seems to arrive at his damage threshold estimate. He alleges our beam currents “exceed by tenfold the damage threshold reported by Larbalestier et al.” when Larbalestier et al. [6] do not even report their beam current. He appears to base his estimate on a reference cited in the paper that quotes 15 pA beam current. But this was the current needed for Z-contrast imaging, not for EELS, which requires higher beam currents. Thus the tenfold estimate is based on lower current than actually used by Larbalestier et al.

It is unfortunate that Muller would make such published statements without checking with both sets of authors regarding the beam currents that were actually used.

A Selectively Altered Line Profile?

Muller claims selective data manipulation in connection with the LCMO/YBCO superlattices reported in the cond-mat preprint [3]. Some of the data were reported earlier, and Muller states “In the earlier work (e.g SSE) the EELS was recorded at a La-terminated interface. In the later papers however the authors note “*the terminating MnO₂ planes electronically couple the manganite to the YBCO*” and now images are shown for a Mn-terminated interface, and **the EELS data is selectively altered to show a SHARP, Mn- terminated interface instead.**”

But the statement “the EELS was recorded at a La-terminated interface” was **not** what was reported in the earlier Solid State Electronics (SSE) paper [7]. Muller makes a conclusion regarding the interface termination, again without checking with us, and then accuses us of changing it. The interface termination never changed, and the EELS data were never selectively altered. Both papers use the same figure and extract the same conclusion, a sharp interface, with no interdiffusion. No conclusion on interface termination was drawn from this figure or from the EELS data in any version of the paper. We show in detail below how the conclusions were derived.

The 2nd version of the cond-mat paper now references Sol Stat Elec 47 (2003) p 2245 as the origin for cond-mat Fig2a:

2248

M. Varela et al / Solid-State Electronics 47 (2003) 2245–2248

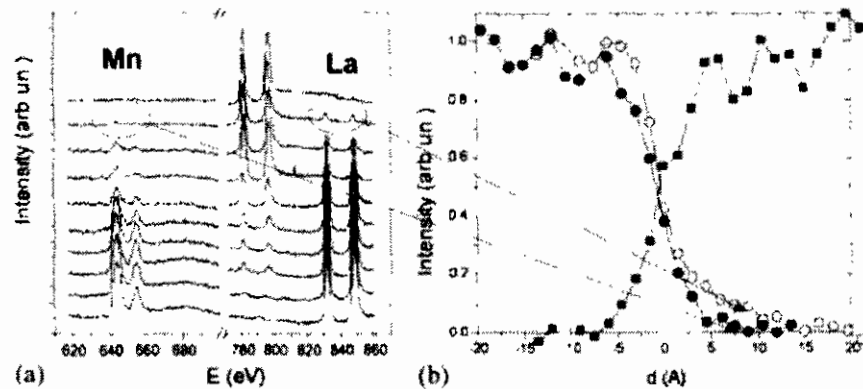


Fig. 4. (a) EEL spectra across the interface showing how the La $M_{2,3}$ edge (840 eV), Ba $M_{2,3}$ (781 eV) and Mn $L_{2,3}$ (642 eV) change across the interface. The spectra were acquired by successive jumps of 2 Å. (b) Integrated intensity, after normalization for La (open circles), Ba (solid squares) and Mn (solid circles) as a function of the distance to the interface.

Open circles in Fig 4b are the integrated La counts.

Solid circles are the integrated Mn counts. The Mn signal decays more quickly than La, consistent with spectra from fig 4a. – i.e. a La-terminated interface with La diffusing 15 Å into the YBCO.

Fig. 13: PowerPoint slide where Muller interprets the traces as indicating a La-terminated interface, contrary to our published assertions.

Figure 13 shows Muller's PowerPoint slide circulated in December 2006 where he says "The Mn signal decays more quickly than La, consistent with spectra from fig 4a. – i.e. a La-terminated interface." He appears to be interpreting a small shift (of the order of 1 Å) between the La and Mn traces as evidence of the interface termination. But such an interpretation is not valid because the profiles were not obtained in the same scan. The EELS system used for this work had only 385 channels. It was not possible to maintain good energy resolution over the necessary energy range to collect all three edges simultaneously. Two separate scans were used for the profiles, which might have been inferred from the break in the axis in Fig. 4a. The traces were aligned as best as possible, but given the chance of specimen drift it is not scientifically defensible to interpret the small offset between the La and Mn traces as indicative of interface termination, and we hence made no such interpretation.

Figure 2 of the SSE paper does show a Z-contrast image of a La-terminated interface, but the text of the paper clearly states "the most common structure that was found by far was a MnO terminating plane." Furthermore, the caption to Fig. 3 states definitively "the LCMO layer is terminated in a Mn–O plane." The EELS line trace was recorded across a Mn-terminated interface, the dominant, most commonly found interface. Unfortunately, when the SSE data was incorporated into the PRL and cond-mat submissions, a new Ca

profile was added, and some of the symbols were mislabeled in the figure caption. If Muller had contacted us we could have quickly resolved this issue. This was an unintentional error that had no effect on the paper's conclusions.

Instead, as shown in Fig. 14, Muller accuses us of selectively altering the La trace in order to convert the "inconvenient" La termination into Mn.

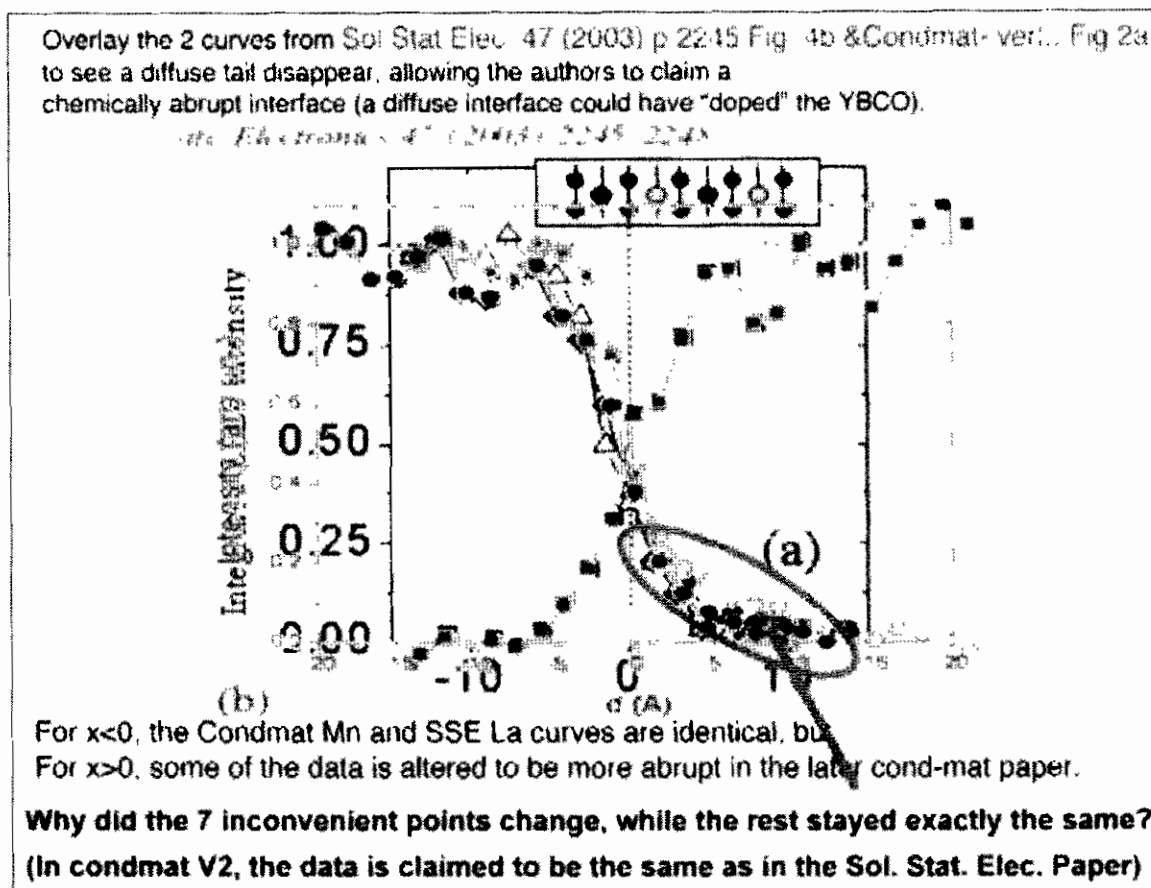


Fig. 14: Slide where seven reanalyzed La concentrations are assumed "inconvenient" to us.

Muller states that a diffuse tail has disappeared in the cond-mat preprint, "allowing the authors to claim a chemically abrupt interface (a diffuse interface could have "doped" the YBCO). Why did the 7 inconvenient points change while the rest stayed exactly the same?" The 7 points questioned were not in any way inconvenient. In the text we speculated that the observed charge transfer originated in band bending due to a Fermi level mismatch across the interfaces. We did not attribute the charge transfer to interdiffusion, neither did we rule it out. The subject of the paper was charge transfer, and the conclusions concern charge transfer only, and there are many possible origins.

The data points for La in the YBCO were reanalyzed between the initial Solid State Electronics paper and subsequent submissions using a spatial difference method, a commonly used method, widely accepted in the community. There were two reasons for the reanalysis. First, on the right hand side of the interface, the YBCO layer, it was not

possible to fit an accurate power law in the pre-edge region of the La because of the tail from the large Ba peaks. Second, it was realized that surface La was most likely spurious, arising from ion milling. Therefore the spatial difference method is appropriate and addresses both issues. On the left of the interface, the LCMO, there are no large Ba peaks, and use of a Ba spectrum for background subtraction would not be reasonable.

In the following we show these procedures in more detail. In the YBCO, the small La signals sit on the tail of the large Ba edge, as the one shown Fig. 15. A rough background fit could be obtained using a small energy window, but because the energy window was much smaller than the required extrapolation, the La concentration measurement would have significant error bars. The spatial difference method would provide a much more accurate background subtraction in this situation.

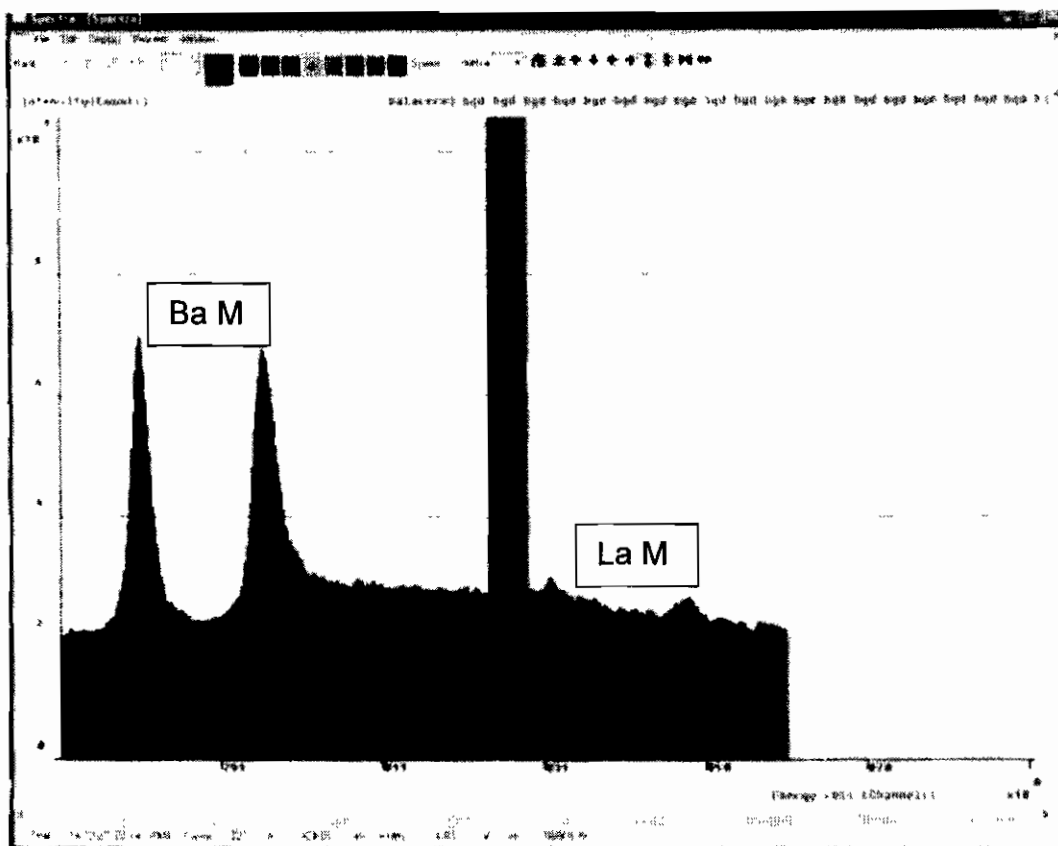


Fig. 15: The La edge sits on the tail of the Ba edge where the spectra cannot be accurately fitted with a power law. Use of a narrow energy window can give a rough measurement, but the spatial difference method would be more accurate.

A second reason for using the spatial difference method was the appreciation that surface debris was in fact a significant problem. When the Gatan Enfina was installed on the 100 kV microscope it did become feasible to perform scans over wide areas, as shown by Fig. 7. In some regions of the sample uniform La and Mn concentrations were found in the center of the thick YBCO layers, but not in others. Clearly, if this effect were due to real interdiffusion then the same behavior would be found everywhere along an interface,

independent of position and specimen thickness. If it were due to surface debris from ion milling it could vary from place to place, which was the behavior found experimentally. For this reason the La signals from the YBCO layer were analyzed using the spatial difference technique, using the La signal from the center of the YBCO as the reference. The La in the LCMO of course was not analyzed this way, since using a Ba reference spectrum for background subtraction would make no sense where there is no Ba, so the usual power law method was used for these points. We did not mention the background subtraction methods in any of the manuscripts; the methods used for the reanalysis were those we believed would give the most accurate concentration profile. There was no attempt or reason to remove any "inconvenient" La.

The interface termination was actually determined from the one unit cell superlattice. In the cond-mat preprint we stated "Figure 3(a) shows a Z-contrast image of a $[\text{YBCO}_{1 \text{ u.c.}}/\text{LCMO}_{15 \text{ u.c.}}]_{100\text{nm}}$ sample. The incomplete YBCO layer is marked with an arrow. Its structure, as identified from the images and also by atomic plane by atomic plane EELS, shows an atomic plane stacking of $\text{MnO}_2\text{-BaO-CuO}_2\text{-Y-CuO}_2\text{-BaO-MnO}_2$ ". Figure 16 reproduces Fig 3a from the cond-mat preprint.

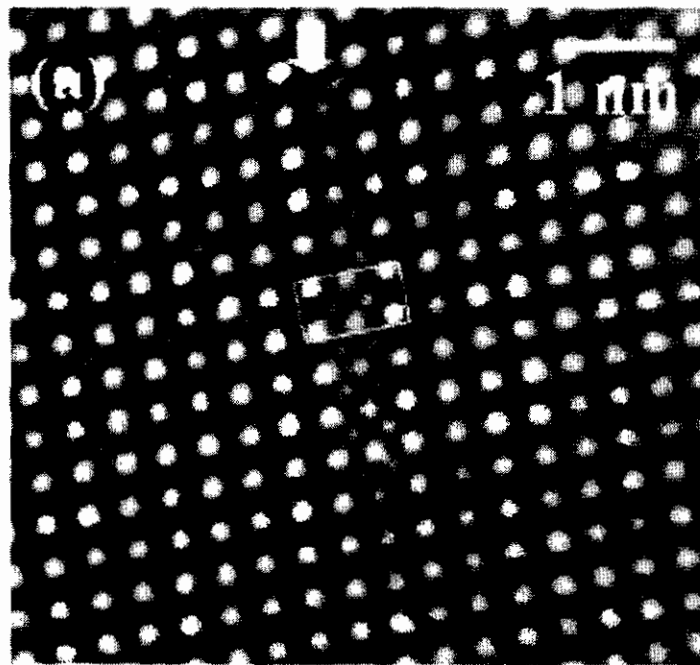


Fig. 16: Figure 3a of the cond-mat preprint, where the original caption read "High resolution Z-contrast image of a $[\text{YBCO}_{1 \text{ u.c.}}/\text{LCMO}_{15 \text{ u.c.}}]_{100\text{nm}}$ superlattice. The YBCO layer has been marked with an arrow. One YBCO unit cell has been marked with a rectangle."

Since La and Ba are adjacent in the periodic table it would be difficult to establish the identity of the cation sequence across the nominal one unit cell YBCO layer. It could be either $\text{MnO}_2\text{-BaO-CuO}_2\text{-Y-CuO}_2\text{-BaO-MnO}_2$ or $\text{MnO}_2\text{-LaO-CuO}_2\text{-Y-CuO}_2\text{-LaO-MnO}_2$. To distinguish the possibilities EELS was used. Placing the beam in the center of the thin

YBCO layer showed very little La but a strong signal from Ba. The bright columns in the rectangle were therefore identified positively as Ba, and the Mn termination was therefore assumed for both the 1 unit cell and 10 unit cell superlattices.

Charge transfer in YBCO/LCMO multilayers

In a PowerPoint file Muller makes the following statement concerning the samples studied in the cond-mat preprints :

“Fig 3c&4b shows **identical** data for two **different** systems (pg 2-3)

Fig 4b: A **fictional multilayer structure** with an unphysical symmetry is constructed by mirroring data and digitally altering/cropping an image of a single interface. (pg 4,5,11-13). It is described as "measured data", both in the figure caption and body of the paper.

In v2 this is replaced by a single interface with different data for the red plot (pg 14).

The blue data in V2 is also changed – thus altering the charge transfer at the interface. »

The figure contains measured data, although we acknowledge the data presentation was not clearly described in the first cond-mat preprint and the *Nature Physics* submission. The blue color coding was intended to show that the YBCO data were mirrored left and right. The figure was intended as a concise visual presentation of the *conclusions* of the work, as we show below. It was not “a fictional multilayer structure” made up to *derive* any of the conclusions as implied by Muller. Figure 17 reproduces Fig. 4 of the first cond-mat preprint [3].

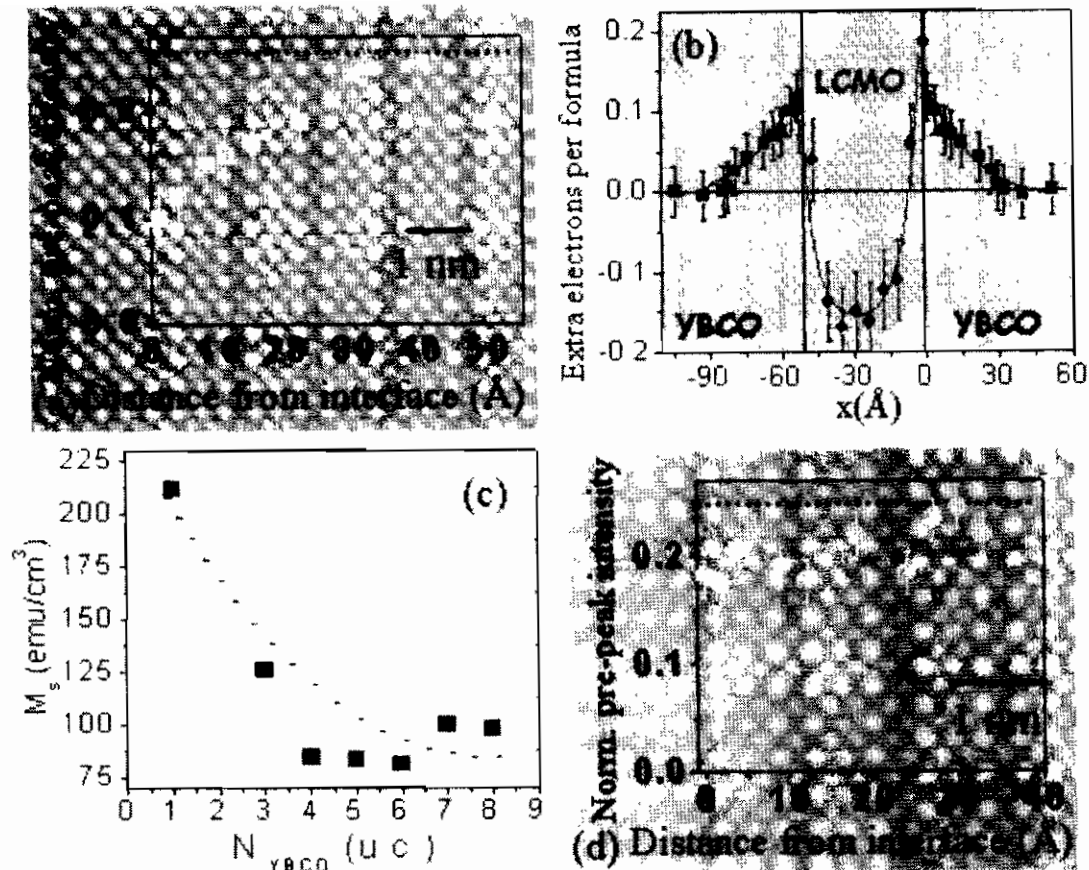


Fig. 17: Figure 4 of the first cond-mat preprint, where the caption read: (Color online) (a) Normalized pre-peak intensity for the O K edge acquired at the YBCO side of a YBCO/LCMO interface, as a function to the distance to the interface. The horizontal dotted line marks the pre-peak intensity in bulk YBCO. (b) Amount of excess (depleted) electrons per formula within the YBCO (LCMO) layers as a function of distance along the growth direction, as measured from EELS. Red and blue lines are a guide to the eye. The vertical black lines represent the interface positions. (c) Saturation magnetization measured at 5K for a set of $[YBCO_n \text{ u.c.}/LCMO_{15} \text{ u.c.}]_{100\text{nm}}$ superlattices vs. YBCO thickness. The dotted line is a guide to the eye. (d) Normalized pre-peak intensity within the YBCO in a YBCO/PBCO interface, as a function to the distance to the interface. The background images are in real scale in all cases.

The color coding of panel (b) was intended to show the composite nature of the image, the blue regions coming from a quantification of the O K pre-peak intensity presented in panel (a) and the red region coming from a quantification of the Mn $L_{2,3}$ ratio across the LCMO layer. In the *Nature Physics* submission this was made more explicit, as shown in Fig. 18, where the red and blue data sets are shown in panels a and b, and the composite is shown in c.

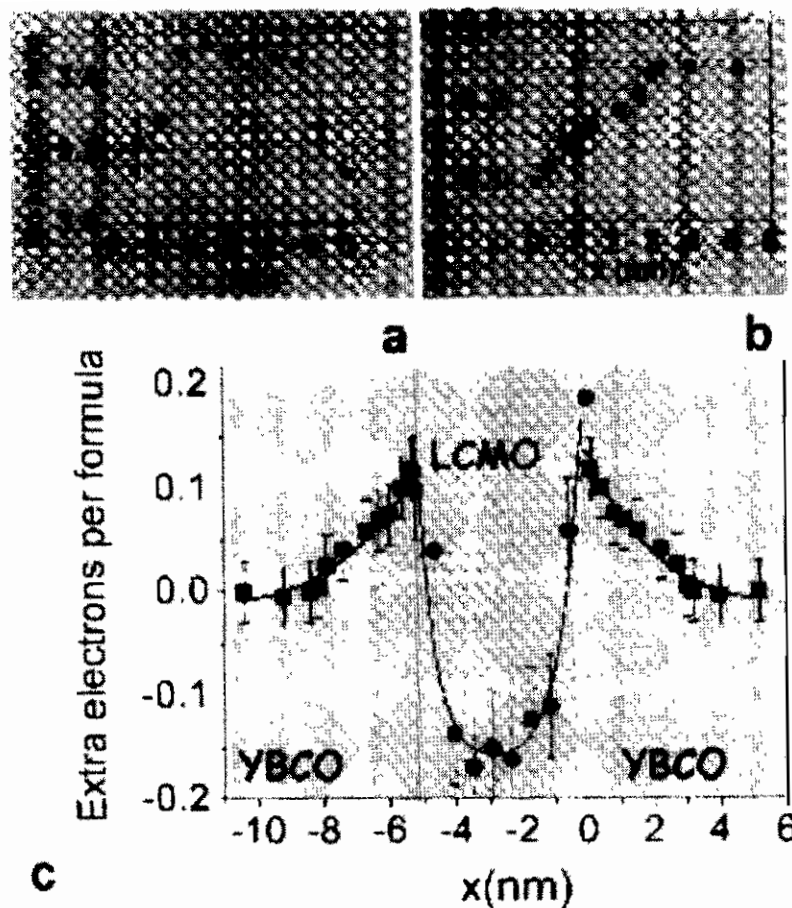


Fig. 18: Figure 3 of the Nature Physics submission, where the caption read: Electronic properties of the layers. (a) Mn formal oxidation state across the LCMO layer for the $[\text{YBCO}_{10 \text{ u.c.}}/\text{LCMO}_{15 \text{ u.c.}}]_{100 \text{ nm}}$ sample. The data have been averaged over a lateral length of 8 nm. Dotted vertical lines mark the interface locations. (b) Normalized pre-peak intensity for the O K edge acquired at the YBCO side of the YBCO/LCMO interface, as a function of the distance to the interface. The horizontal dotted line marks the pre-peak intensity in bulk YBCO. (c) Amount of excess (depleted) electrons per formula unit within the YBCO (LCMO) layers as a function of distance along the growth direction, as measured from EELS. Red and blue lines are a guide to the eye. The vertical light blue lines represent the interface positions, and the images in the background are to scale.

There was never any intent to imply a single EELS scan had been made. Each blue point in the hole concentration profile was obtained by summing spectra at the same distance from many interfaces in order to obtain the necessary statistics. It is therefore an average profile. In hindsight, the distance scale on the lower axis and the inclusion of the data points and error bars could be taken to imply a single EELS scan had been performed across the entire region, which had not been done, and we regret the error, which was corrected in a second posting to the cond-mat site [8].

However, neither caption for the composite part of the figure referred to any specific specimen. Neither did the text. It was intended as a schematic depiction of the charge transfer scenario. In an earlier draft, black lines were used for the schematic, as shown in Fig. 19.

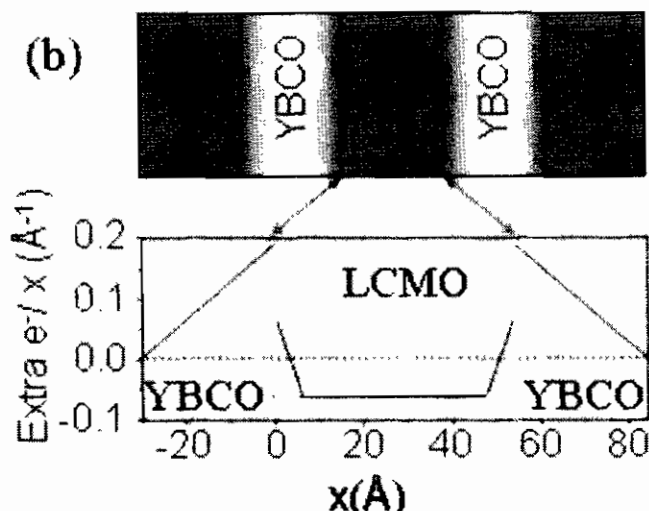


Fig. 19: Figure 4 from an earlier draft of the cond-mat preprint, where the caption read: Figure 4: (b) (Top) Sketch of the YBCO/LCMO superlattice. The shaded interface areas within the YBCO layers represent the hole depleted layers as a result of the charge transfer from the ferromagnet. (Bottom) Amount of extra (depleted) electrons per unit length within the YBCO (LCMO) layers as a function of distance along the growth direction, as measured from EELS. The red dotted line represents the average doping of the bulk. Green dotted lines mark the interfaces

In Fig. 19 the purpose of the axes is to set the scale for the charge transfer phenomenon. All YBCO scans showed the same trend; there was no difference between the top and bottom interface with respect to the growth direction. The figure accurately conveyed the central conclusion of the paper. The caption is correct in stating “Amount of extra (depleted) electrons per unit length within the YBCO (LCMO) layers as a function of distance along the growth direction, as measured from EELS.” It is clear that this is a schematic depiction of the conclusions of the work. This wording is essentially unchanged in the later versions, but the black lines were replaced with the blue and red data curves which we agree should have been labeled to clearly note that the YBCO data had been mirrored.

The background images were also composites, intended simply for visual clarity, never intended to imply any simultaneous acquisition or the precise location of the EELS data. They were never used to support any of the claims of the paper. No reference is made to background images anywhere in the main text, only in figure captions. The background is intended to help to locate the position of the interfaces and the different layers at a glance, for illustrative purposes only. We never tried to conceal the fact that the image was a composite and therefore the seam is visible to the eye without analyzing the image

in detail. The image is actually the one used for Fig. 1(c) in all the submissions, which was rotated and did not fill the space required for the background.

The red data in the *Nature Physics* submission was from the one unit cell sample, whereas it was intended to be from the 10 unit cell sample, as the figure caption clearly states (reproduced in Fig. 18). This error allowed Muller to allege that the thicker sample never existed. But the text refers to the correct numbers for the ten unit cell sample, which are different to those for the one unit cell sample. The correct LCMO curve actually showed more charge transfer than the single cell data that was shown in the figure. The correct data set is compared to the one plotted by mistake in Fig. 20.

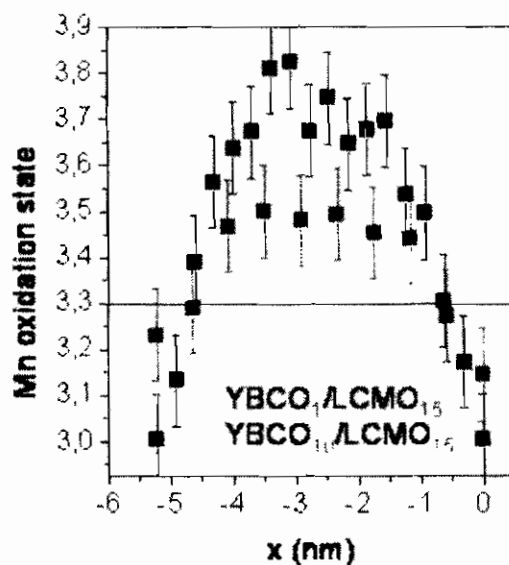


Fig. 20: Comparison of Mn oxidation state across the LCMO layer in the one unit cell (red) and ten unit cell superlattices (blue). The LCMO thickness was the same in each sample.

Throughout the discussion of Figure 4b (page 6 of the main text of the manuscript) we do refer to the correct YBCO₁₀/LCMO₁₅ sample. Citing from page 6: “While the overall qualitative behavior of the Mn valence in the LCMO layers in this sample is like that shown in figure 3(c) [the one unit cell sample], the average Mn formal oxidation state was found to increase with increasing YBCO thickness. In this sample [the 10 unit cell sample], its value is $+3.5 \pm 0.10$. If we keep in mind that the nominal chemical doping yields an average Mn valence of $+3.3$ (the value confirmed by EELS in bulk LCMO samples), around 0.2 electrons per LCMO unit cell are missing.” This was the central conclusion of the work.

After the misconduct allegations were received it was realized that the red curve was wrong and a new posting was made to the cond-mat preprint server to correct the data and avoid the duplicated blue curve [8]. In this figure we showed only half of the data for the thick YBCO sample so that the areas under the red and blue curves could again be visually compared, as in the original composite figure. The new figure is reproduced in Fig. 21.

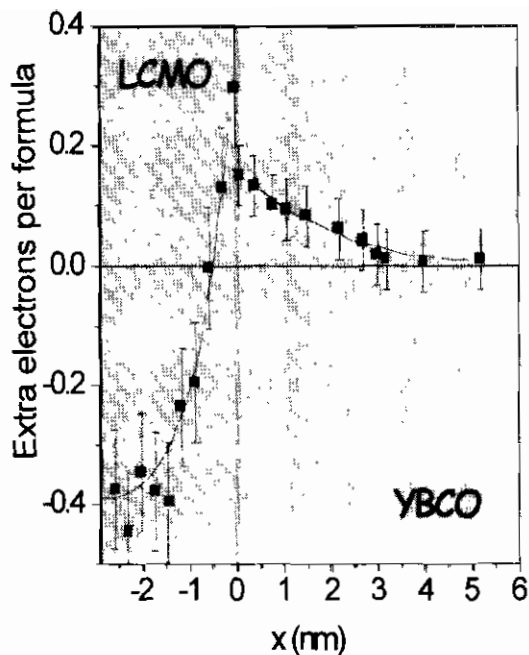


Fig. 21: The new Fig. 4b in the second Cond-mat posting, showing only half the red data set so that the areas under the red and blue curves could be easily compared by eye.

Muller now states: *"The average valence for the LCMO layer is still reported (unchanged) in the paper even though this would require EELS measurements across the whole layer, which is no longer the case."* As shown in Fig. 20, measurements were taken across the entire LCMO layer.

Valence stripes in mixed-valence manganites

Muller takes issue with more of Varela's valence profiles in another system, the first direct EELS observation of the so-called charge ordering phenomenon in manganites. Again he alleges the data do not support the conclusions and that points have been duplicated to fabricate a chemical shift. Figure 22 shows the first slide from an e-mail circulated by Muller in December 2007.

M. Varela, A.R. Lupini, K. van Benthem, A.Y. Borisevich, M.F. Chisholm, N. E. Abe, and S.J. Pennycook

Ann. Rev. Mater. Res. 35 (2005) 539–69

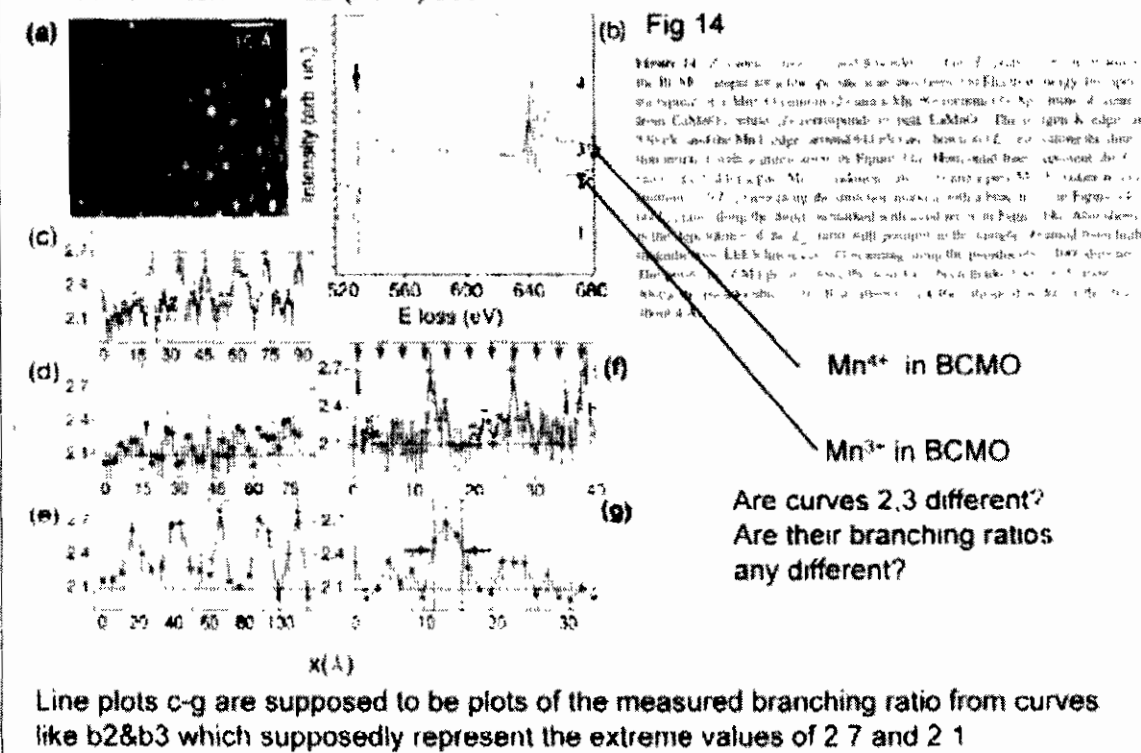


Fig. 22: PowerPoint slide circulated by Muller questioning Varela's observation of valence stripes in a mixed valence manganite.

Muller questions whether curves 2 and 3 are different and states in the next slide "*Varela reports a L23 ratio of 2.1 for Mn⁴⁺ and 2.7 for Mn³⁺. This means the height of the L2 peak relative to the L3 must change by 28% if the valence is changed from 3+ to 4+ as is claimed for curves 2,3.* But this is not true, it is the ratio of the integrated areas, after background and continuum corrections, that should change by 28%. In the next slide he shows reproductions of the published spectra, scaled and superimposed. His slide is reproduced in Fig. 23.

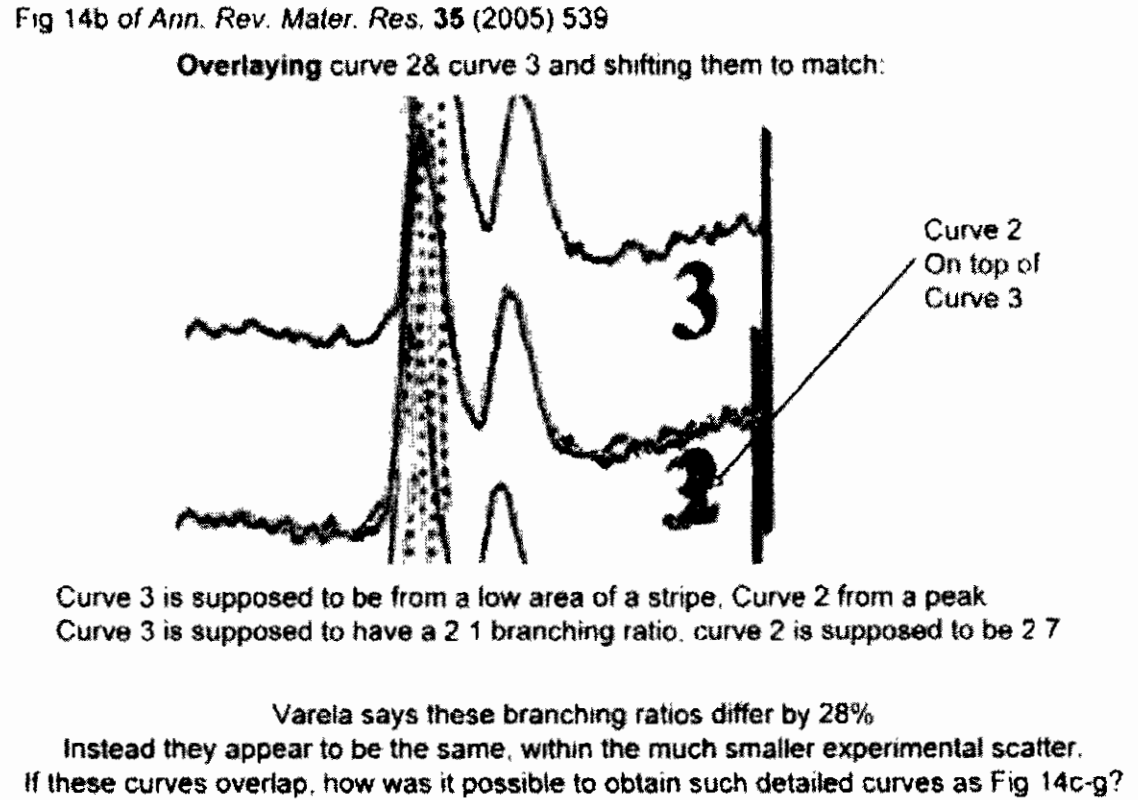


Fig. 23: Muller's slide #3 showing Varela's spectra scaled and overlaid so that the L2 peaks appear to match, but the L3 peak is obscured.

He overlays curves 2 and 3 and we see the L2 peak scaled to match. He appears to imply that the L23 ratios were manufactured. The L23 ratios were obtained by consistent application of an adaptation of the method reported by Wang et al. [9], involving the subtraction of the continuum contribution and integration of the areas. During the ORNL inquiry, Varela was asked to reproduce selected results involving her L23 ratio analysis. The original files were located, the creation dates were appropriate, and reanalysis reproduced the original results. Reanalysis of the two L23 ratios obtained from the two curves reproduced in Fig. 23 are 2.75 and 2.02, in perfect agreement with the values published [10] and quite different from each other. It is not just peak height that changes, but peak shape, and overlaying scanned images is not a scientifically defensible analysis procedure.

The change in valence was also indicated by a chemical shift, which Muller chooses to attribute to the insertion of an extra point in the data, as shown in Fig. 24.

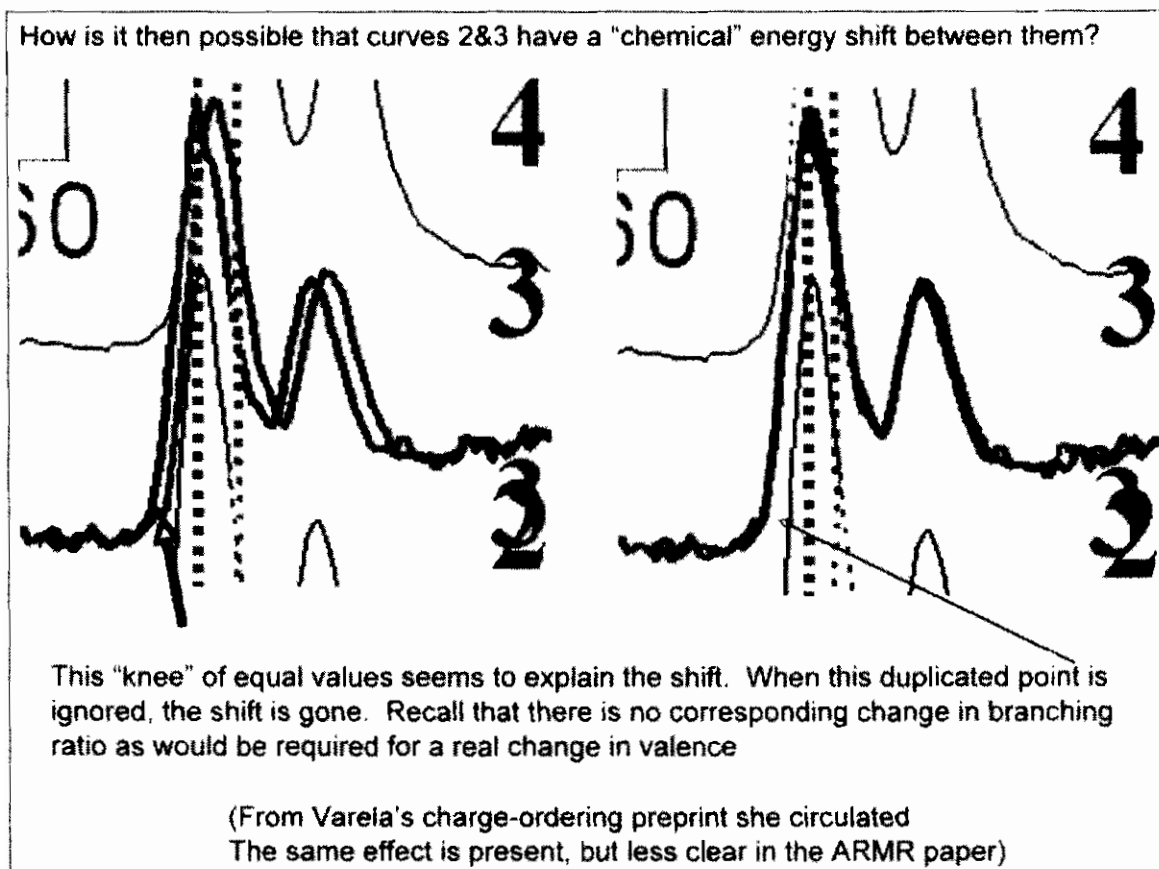


Fig. 24: Muller's slide #6 alleging that an extra point was inserted in the data to create a chemical shift.

The chemical shift is present in the original data, but was not used for quantification purposes.

Same data shifted in different samples?

In the first PowerPoint file sent by *Nature Physics* there are several allegations of the same data reported for allegedly different samples, and an accusation that the "*data were shifted by ~0.3 electrons (necessary to create charge balance, central to their claims)*". To this day we do not know the identity of the accuser. Figure 25 shows one slide that alleges different samples, same data.

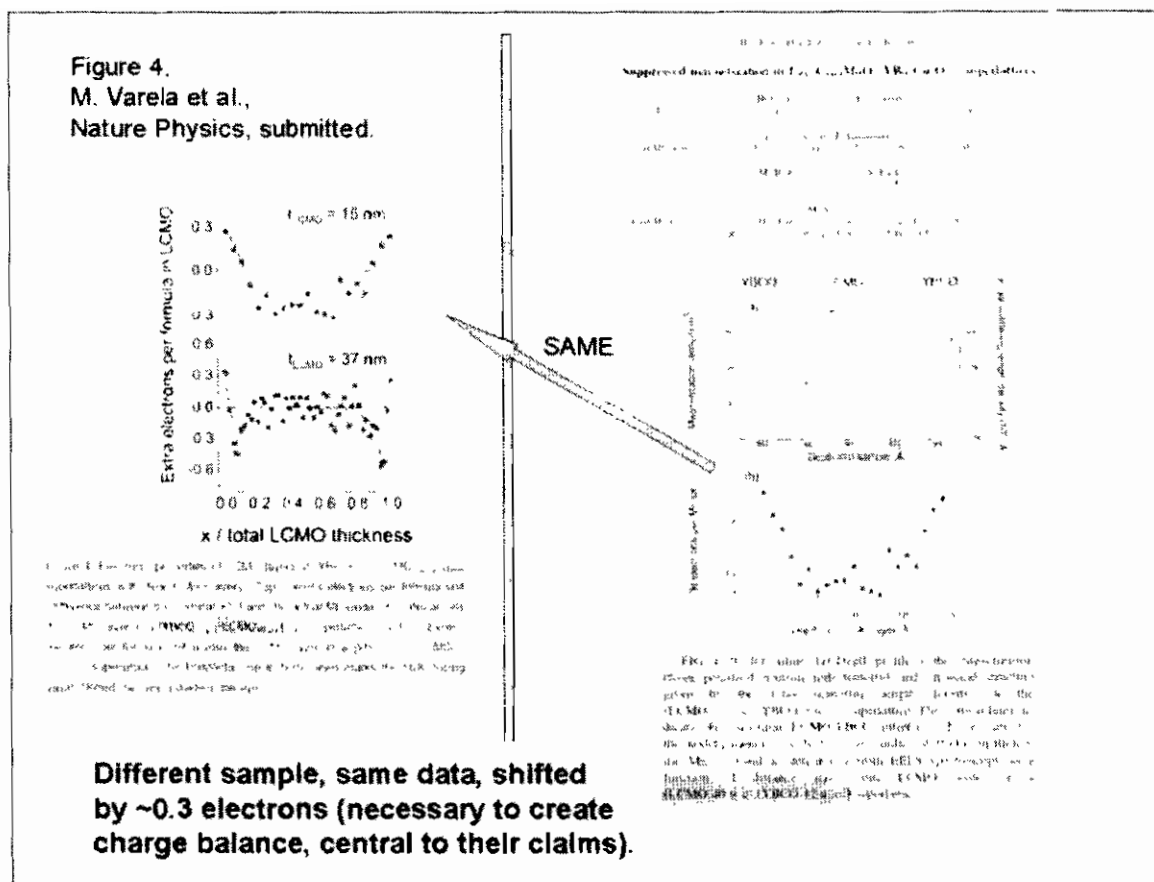


Fig. 25: Slide from the original PowerPoint file sent by Nature Physics to Varela in May 2006 alleging same data used for different samples, but shifted by 0.3 electrons.

We have already discussed the origin of the seemingly different YBCO thicknesses reported in the preprints and subsequent work. The *Nature Physics* submission reported the nominal superlattice periodicity anticipated from the growth times for each layer, while the *Physical Review B* paper [11] reported the thickness estimated from x-ray diffraction analysis. The samples were the same.

The alleged 0.3 electron shift is because the vertical axis of each graph is different. The preprint plotted extra electrons per formula unit whereas the paper published in *Physical Review B* plotted the number of 3d electrons per Mn ion. These quantities differ by 0.3 electrons. The reason is straightforward. A neutral Mn atom has 7 electrons in its outer shells. In $\text{La}_{0.7}\text{Ca}_{0.3}\text{MnO}_3$ La has an oxidation state of +3 and Ca has an oxidation state of +2. For charge neutrality to be preserved a total of 6 electrons are required by the O. The La provides $0.7 \times 3 = 2.1$ and the Ca provides $0.3 \times 2 = 0.6$, leaving 3.3 to be donated by the Mn. The Mn oxidation state is 3.3 and consequently it has 3.7 electrons left in its 3d band. For this material, the excess number of electrons per formula unit is the excess over 3.7, the charge neutrality level, ie.

$$\text{Excess number of electrons} = \text{Measured 3d electrons per Mn} - 3.7$$

The two data sets differ by 3.7. There is no artificial shift.

The accuser alleges that in different papers the same data is presented for samples with different stoichiometry, one being $\text{La}_{0.7}\text{Ca}_{0.3}\text{MnO}_3$ and the other being $\text{La}_{0.67}\text{Ca}_{0.33}\text{MnO}_3$. These are, in fact, the same samples, since 0.3 is just 0.33 rounded to one decimal place and 0.7 is just 0.67 rounded to one decimal place. The phase diagram in this composition range, generally referred to as the $\text{La}_{2/3}\text{Ca}_{1/3}$ portion, is very flat and featureless and no difference would be expected in a 3 percentage point change in stoichiometry. In fact, it would be very difficult to measure stoichiometry to such levels of accuracy in a thin film. Nevertheless, a similar allegation is brought in connection with the caption to Figure 4 of another *Physical Review B* article [12], in which a series of superlattices are referred to as “[LCMO (5 unit cell)/YBCO (N_S unit cell)] with $N_S = 1, 2, 3, \dots$ ” The text however only refers to “superlattices with fixed LCMO thickness (15 unit cells) and changing the thickness of the YBCO from 1 to 12 unit cells”. The figure caption was a simple typographical error, obvious from the text.

Summary

We admit that mistakes have been made and errors of judgment made in regard to data presentation, which we deeply regret, but never have we fabricated or falsified data. All allegations have a simple explanation, often trivial. In all cases a direct enquiry to the authors could have resolved the issue. We believe it is time to cease unprofessional allegations. Scientific issues should be raised directly with the authors. If issues cannot be resolved directly, they should be raised in the open peer-reviewed scientific literature rather than by circulation of unsubstantiated allegations through PowerPoint files.

References

1. Browning, N. D., Chisholm, M. F. & Pennycook, S. J. Corrigendum: Atomic-Resolution Chemical-Analysis Using a Scanning-Transmission Electron-Microscope. *Nature* **444**, 235 (2006).
2. <http://www.ornl.gov/investigation>
3. Varela, M., Lupini, A. R., Peña, V., Sefrioui, Z., Arslan, I., Browning, N. D., Santamaria, J. & Pennycook, S. J. Direct measurement of charge transfer phenomena at ferromagnetic/superconducting oxide interfaces. arxiv.org/pdf/cond-mat/0508564v1 (2005).
4. Mannhart, J. & Muller, D. A., Catching dopants in action. *Nature Materials* **4**, 431-432, (2005).
5. Klie, R. F., Buban, J. P., Varela, M., Franceschetti, A., Jooss, C., Zhu, Y., Browning, N. D., Pantelides, S. T. & Pennycook, S. J. Enhanced current transport at grain boundaries in high-Tc superconductors. *Nature* **435**, 475-478 (2005).
6. Song, X., Daniels, G. D., Feldmann, M., Gurevich, A. & Larbalestier, D. Electromagnetic, atomic structure and chemistry changes induced by Ca-doping of low-angle $\text{YBa}_2\text{Cu}_3\text{O}_{7-\delta}$ grain boundaries. *Nature Mater.* **4**, 470-475 (2005).

7. Varela, M., Lupini, A. R., Pennycook, S. J., Sefrioui, Z. & Santamaria, J. Nanoscale analysis of $\text{YBa}_2\text{Cu}_3\text{O}_{7-x}/\text{La}_{0.67}\text{Ca}_{0.33}\text{MnO}_3$ interfaces. *Solid State Electron.* **47**, 2245-2248 (2003).
8. Varela, M., Lupini, A. R., Peña, V., Sefrioui, Z., Arslan, I., Browning, N. D., Santamaria, J. & Pennycook, S. J. Direct measurement of charge transfer phenomena at ferromagnetic/superconducting oxide interfaces. <http://arxiv.org/pdf/cond-mat/0508564v2>.
9. Wang, Z. L., Yin, J. S. & Jiang, Y. D. EELS analysis of cation valence states and oxygen vacancies in magnetic oxides. *Micron* **31**, 571-580 (2000).
10. Varela, M., Lupini, A. R., van Benthem, K., Borisevich, A., Chisholm, M. F., Shibata, N., Abe, E. & Pennycook, S. J. Materials Characterization in the Aberration-Corrected Scanning Transmission Electron Microscope. In "Annu. Rev. Mater. Res." pp. 539-569. Annual Reviews, (2005).
11. Hoffmann, A., te Velthuis, S. G. E., Sefrioui, Z., Santamaria, J., Fitzsimmons, M. R., Park, S. & Varela, M. Suppressed magnetization in $\text{La}_{0.7}\text{Ca}_{0.3}\text{MnO}_3/\text{YBa}_2\text{Cu}_3\text{O}_{7-\delta}$ superlattices. *Phys. Rev. B* **72**, Art. No. 140407 (2005).
12. Sefrioui, Z., Arias, D., Peña, V., Villegas, J. E., Varela, M., Prieto, P., Leon, C., Martinez, J. L. & Santamaria, J. Ferromagnetic/superconducting proximity effect in $\text{La}_{0.7}\text{Ca}_{0.3}\text{MnO}_3/\text{YBa}_2\text{Cu}_3\text{O}_{7-\delta}$ superlattices. *Phys. Rev. B* **67**, Art. No. 214511 (2003).

**Statement of the
Independent Investigating Committee
Regarding Allegations of
Research Misconduct at ORNL**

**C. Barry Carter, Department Head
Department of Chemical, Materials & Biomolecular Engineering
University of Connecticut**

**David B. Williams, President
The University of Alabama in Huntsville**

**Paul S. Peercy, Dean of Engineering
University of Wisconsin-Madison**

An independent external investigation has concluded unanimously that there is no evidence for research misconduct, although some errors were made that have been acknowledged by the authors. These errors were judged to have no material impact on the scientific conclusions.

During the review of a manuscript "Direct measurement of charge transfer phenomena at oxide interfaces" by M. Varela et al, submitted to *Nature Physics* in early 2006, a referee anonymously alleged that the article contained potential data manipulation and misrepresentation. The Associate Editor of *Nature Physics* returned the paper to the authors and, on the same day, the Physical Sciences Editor of *Nature* raised similar concerns from an anonymous reviewer regarding potential data misrepresentation in an earlier paper entitled "Atomic-resolution chemical analysis using a scanning transmission electron microscope" by N. D. Browning et al, *Nature* 366 143-146, November 1993.

The Deputy Director, Science and Technology at Oak Ridge National Laboratory (ORNL) appointed an independent Investigating Committee of scientists/research managers from universities not affiliated with ORNL to review the results surrounding these allegations, along with the results of the ORNL inquiry into the allegations and associated documentation. The Committee did not know the subject of this investigation until they received the documents mentioned below. Members of the Committee did not know who the other members of the Committee would be until arriving at the meeting at ORNL. In addition, the complainants maintained their anonymity and did not identify themselves to this Committee during the investigation; this information did not become public until after the Committee had completed its investigation. After the Committee issued its report to ORNL management, one of the complainants contacted a member of the Committee. Discussions with the complainant did not change the Committee's conclusions.

Prior to convening at ORNL, the Committee was provided with the names of the authors of the two papers in question and detailed documentation of the ORNL inquiry into the allegations noted above. This documentation included complete information about the

Nature Physics manuscript, the correspondence surrounding the 1993 *Nature* paper, and a copy of the vast majority of the data and analysis used in that paper and related publications. Each member of the Committee independently studied this material, but did not discuss the material or any aspects of the case prior to arriving at ORNL on July 11, 2006.*

The Committee was asked to determine if allegations that the original data were misrepresented to justify the scientific claims of the papers are substantiated. The Committee was given complete cooperation by the ORNL management, staff, and the scientists whose actions were being investigated and invited to ask any questions they deemed appropriate. The Committee was also asked to suggest improvements to ORNL internal practices with regard to manuscript preparation / review.

The Committee began its on-site review by meeting with the ORNL Deputy Director, Science and Technology, who reviewed the history of the case, summarized the charge to the Committee, and addressed questions from members of the Committee. The Committee then agreed upon the detailed approach it would use in its investigation. The Committee had extensive discussion with a retired scientist who was hired by the Deputy Director to perform an in-depth, third-party review of the allegations and the facts / actions surrounding the papers in question.

Three of the authors of the papers in question were interviewed by the Committee: the first author of each of the two papers and the only author common to the two papers. These interviews covered events surrounding the collection and analysis of the data, preparation of the manuscripts, correspondence with the referee (via the Physical Sciences Editor of *Nature*), and the internal review process followed by this research group. The Committee also reviewed electronic files to examine data manipulation performed by the complainants in order to better understand the complainants' concerns.

The conclusion of the Investigating Committee is that, while there were errors of judgment and selection and analysis of data, there was no fabrication or falsification of the results. The Investigating Committee found no evidence for research misconduct or fraud in either paper. Furthermore, the committee found no evidence for a pattern of scientific misconduct or misrepresentation of data as implied by the complainant. The Committee also found the primary scientific finding of the 1993 *Nature* paper, namely that the Co signal changes discretely over one atomic plane (by generally accepted criteria), to be reasonable. This conclusion is evident from the spectral data, with or without additional processing.

The Investigating Committee believes that the authors of the 1993 *Nature* paper made some incorrect statements in their response to the referee's concerns and also included a incorrect statement in the caption to Figure 3 (as the authors acknowledge). While careless, neither of these errors had any effect on the conclusions of the paper and did not involve inappropriate manipulation, fabrication or falsification of data. This behavior therefore does not constitute research misconduct.

The Committee judged the unrelated 2006 *Nature Physics* submission to be of low quality, but found nothing to indicate research misconduct. In particular, it was concluded that the failure to explain the spliced-mirrored data in Figure 3c was the result of carelessness and poor judgment, not intent to deceive. This diagram produced no further scientific insight and did not affect the facts presented in the paper.

* The Committee met in December, 2006, to consider additional concerns that had been raised with regard to this issue after it had submitted its report to ORNL management. The Committee did not change its original conclusions after deliberations in this meeting.

**Independent Investigation Committee
Regarding Allegations of Research Misconduct
at Oak Ridge National Laboratory**

C. Barry Carter

Head, Department of Chemical, Materials, and Biomolecular Engineering
University of Connecticut

Professor Carter was appointed Head of the Chemical, Materials, and Biomolecular Engineering Department at the University of Connecticut in July 2007. Previously, he held the 3M Heltzer Endowed Chair at the University of Minnesota. He is General Secretary of the International Federation of Societies for Microscopy, former President of the Microscopy Society of America, Co-Editor-in-Chief of the *Journal of Materials Science*, and a former Scientific Editor of *Microscopy and Microanalysis* and the *Journal of Microscopy*. His research focuses on electron microscopy studies of dislocations, surfaces, grain boundaries, and phase boundaries. He is a Humboldt Senior Awardee, Fellow of the American Ceramic Society, and author or coauthor of more than 260 refereed journal articles.

Paul S. Peercy

Dean of Engineering
University of Wisconsin–Madison

Professor Peercy is Dean of the College of Engineering and Professor of Materials Science and Engineering at the University of Wisconsin–Madison. He is a former President of SEMI-SEMATECH, a non-profit technical consortium that comprises the equipment and supplier infrastructure of the U.S. semiconductor industry. He is also the former Director of Microelectronics and Photonics at Sandia National Laboratories. Peercy is a member of the National Academy of Engineering; Fellow of the APS, IEEE, and AAAS; and Councilor of the AAAS and former Councilor of the APS and MRS. He is the author or coauthor of more than 180 technical papers.

David B. Williams

President
University of Alabama in Huntsville

Professor Williams has been President of the University of Alabama in Huntsville since July 2007. Previously, he was Harold Chambers Senior Professor and Vice Provost for Research at Lehigh University. He is a former President of the Microbeam Analysis Society and International Union of Microbeam Analysis Societies, Editor of *Acta Materialia* and the *Journal of Microscopy*, and Editorial Board Member of *Microscopy and Analysis*. His research is in the areas of microstructural and microchemical analysis using electron beams. He is a Fellow of the Royal Microscopical Society (U.K.), the American Society for Materials International, and the Minerals, Metals, and Materials Society. He is the author or coauthor of more than 220 refereed publications.

Attachment 15

Loopholes in Oversight Revealed and the DOE Interim Policy on Research Misconduct

NEWS

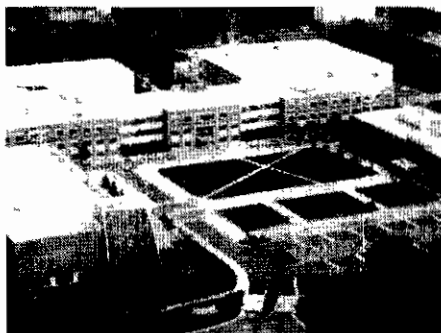
Loopholes in oversight rules revealed

Documents released under the Freedom of Information Act raise questions about how the US Department of Energy (DOE) oversees investigations of misconduct at its science facilities. During such oversight, government officials do not always retain records of the investigations, it has emerged.

DOE officials overseeing an investigation into alleged misconduct at Oak Ridge National Laboratory in Tennessee approved the investigatory panel's findings at a meeting that government officials left without keeping copies of key investigative records. This is according to a 13 November ruling by attorneys at the DOE — issued in response to a Freedom of Information Act request by this reporter.

The story begins in March 2006, when a reviewer for the journal *Nature Physics* alleged that a manuscript submitted by Oak Ridge researchers in the group headed by electron microscopist Stephen Pennycook contained inappropriately manipulated data. An investigation panel convened by the lab's deputy director for science and technology, James Roberto, exonerated Pennycook and others of wrongdoing in July 2006, but other scientists expressed doubts (see *Nature* 444, 129; 2006). In January this year, the DOE said that Oak Ridge, which is run by the not-for-profit company UT-Battelle under a 5-year, US\$6.3-billion contract, had reopened the investigation. "Once again, the committee concluded there was no evidence of misconduct," an Oak Ridge spokesman told *Nature*.

According to the November ruling, DOE officials approved this first finding at a meeting last year with lab officials where they were



Government officials oversaw a misconduct investigation at Oak Ridge National Laboratory.

shown copies of a panel's investigation report in binders marked "do not duplicate", and reviewed the process that the panel used to arrive at its finding of "no misconduct". The lab officials then took the binders back, the ruling says. It adds that although the DOE officials felt that it was "very important" to confirm the panel was objective and composed of people who did not work at Oak Ridge, they apparently did not keep a record of who those investigators were. Last week, Oak Ridge named Paul Peercy of the University of Wisconsin-Madison and David Williams of the University of Alabama in Huntsville, as two panel members.

"Copies of the report were returned as is normal practice with confidential documents," says Oak Ridge's spokesman, Mike Bradley. "Department of Energy officials were not at any time restricted from access to the report," he adds.

The freedom-of-information ruling cites a standard clause in the contract between the DOE and UT-Battelle as evidence that the company

"clearly intended to retain control over the report of investigation". That clause says that records relating to investigations "conducted under an expectation of confidentiality" will be considered the contractor's property. In 2005, Raymond Orbach, director of the DOE Office of Science widened the clause to cover misconduct reports from all US national labs run by the DOE.

In the Oak Ridge case, the DOE did later receive a copy of the investigation report, which the recent ruling orders Orbach's office to consider for public release — overruling his deputy, Patricia Dehmer, who had refused to do so. But Oak Ridge says that it was sent not for oversight but "for informational purposes only".

"Can a government agency fulfil its oversight responsibilities with this degree of access?" asks C. K. Gunsalus, an attorney and misconduct expert at the University of Illinois at Urbana-Champaign. She says that other science-funding agencies employ oversight experts who routinely receive and retain not only investigation reports, but the data at issue and the names of people involved, and analyse these in detail — a process that for a complex case might well take longer than one meeting.

Bioethicist Arthur Caplan of the University of Pennsylvania, Philadelphia, says he can't understand why the DOE introduced a rule relinquishing control of investigation reports. "Why would they give up supervisory powers?" he asks.

Officials in Orbach's office plan to meet this week to discuss the matter.

Eugenie Samuel Reich

13 November ruling

► www.oha.doe.gov/cases/foia/tfa0213.pdf

OAK RIDGE NAT'L LAB.

Deforestation on the agenda at climate meeting

Deforestation issues must be included in global talks on carbon-emissions control, experts say.

European companies seeking to offset their greenhouse-gas emissions under the Kyoto Protocol are pumping billions of dollars into clean-energy projects in the developing world. But the protocol does not include funding initiatives to prevent deforestation, which is responsible for some 20% of global carbon emissions.

Eyeing an economic opportunity

that could put money in the hands of those who preserve native forests rather than chop them down, tropical countries are now banding together to alter the rules after the Kyoto accord expires in 2012. The first step is to ensure that deforestation is on the agenda at Bali, Indonesia, where international negotiators will gather next week for the latest round of United Nations climate-change talks.

"All of the big countries [with tropical forests] have gotten

together to tell the world that they support the same fundamental idea," says Doug Boucher, who works on the issue for the Union of Concerned Scientists, an environmental watchdog based in Cambridge, Massachusetts. Boucher points out that Indonesia has become an international leader on the issue despite being virtually absent from the debate just six months ago. "We may look back on this in a couple of years as having been a turning point," he says.

The idea that deforestation must be addressed in any cohesive response to global warming is not new. Although reforestation projects were allowed during the Kyoto deliberations a decade ago, the question of halting deforestation was dropped, largely because of technical questions. How does one verify a decline in deforestation? And how can anyone be sure that the problem hasn't just moved elsewhere?

A decade after the Kyoto talks, advocates say the issue is ready

Safer way to make human stem-like cells revealed

Shinya Yamanaka of Kyoto University in Japan has refined his method for making human skin cells behave like embryonic stem cells so that it does not use a cancer-causing agent.

Late last month, Yamanaka reported making pluripotent cells — cells that can turn into any of the roughly 220 cell types in the body — by using retroviruses to carry four genes into human skin cells (K. Takahashi *et al.* *Cell* 131, 861–872; 2007). The four genes reprogrammed the cells into a state similar to that of cells in the early embryo. But one of the genes used to make the cell lines is *c-myc*, which can cause cancer.

Yamanaka has now shown that he can make these 'induced pluripotent stem cells' in both humans and mice by using just three factors — not including *c-myc* (M. Nakagawa *et al.* *Nature Biotechnol.* doi:10.1038/nbt11374; 2007).

Risk analysis for Boston lab slammed as 'shoddy'

A US government safety assessment supporting the location of an infectious-disease lab in Boston was "not sound and credible", says a report issued last week by the US National Research Council.

Construction of the \$178-million Boston University National Emerging Infectious Diseases Laboratory is due to finish in 2008, but one state and one federal lawsuit are challenging its opening. The facility will house research on deadly pathogens such as the Ebola and monkeypox viruses.

The report's criticisms are aimed at a document, released by the US National Institutes of Health (NIH) in July, that evaluated the facility's potential threat to its neighbours. It finds that the worst-case

scenarios proposed by the NIH, including an Ebola outbreak caused by an infected lab worker, were not relevant to assessing the true risk. Pathogens with more potential to spread, such as influenza, should have been chosen, the report says. It adds that the NIH assessment suffers from shoddy risk analysis and modelling. The NIH says it will consider the report.

AIDS worker's misconduct ban belatedly comes to light

Scott Brodie, a former researcher at the University of Washington in Seattle, allegedly committed misconduct when doing AIDS research there in the late 1990s and early 2000s, and was banned from working for the university, according to *The Seattle Times*.

The news emerges only now because the newspaper had to win a court case to get a copy of the 2003 report of the investigation. Brodie, under the name John Doe, reportedly sued the university and the newspaper to prevent release of the report.

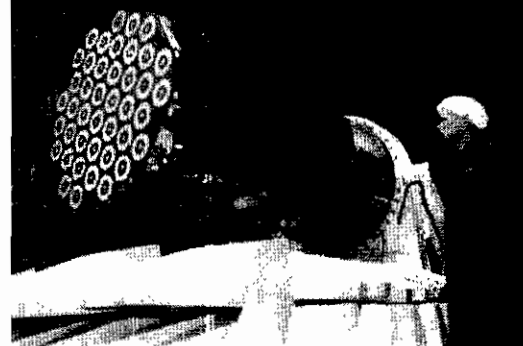
Brodie left the university in summer 2003 and is currently employed by drug company Schering-Plough, based in Kenilworth, New Jersey. A spokesman for the company says that it has just learned of the investigation.

According to one of the university investigators, geneticist Denny Liggitt, the report was handed to the National Institutes of Health's Office of Research Integrity.

European satellite system is back on the launch pad

European transport ministers have revived plans for the Galileo satellite-navigation project. The decision comes almost six months after the collapse of a public-private consortium to build the €3.4-billion (US\$5-billion) network of 30 satellites.

Under the new agreement, the European



Europe's GIOVE-B is being readied for launch.

Union will provide an additional €2.4 billion in unused agricultural funds to finance the system. The decision came despite opposition from Spain, which sought a larger stake in the venture.

Now that funding is confirmed, it will be up to the member states to decide how contracts will be awarded for the project, says Kai-Uwe Schrogl, secretary-general of the European Space Policy Institute in Vienna. "This is now a new game," he says.

So far, only a single test satellite in the Galileo system, GIOVE-A, has been launched. A second, GIOVE-B, has faced repeated delays and is expected to launch in spring next year.

Californian stem-cell directors to be investigated

California officials may investigate potential conflicts of interest in the state's \$3-billion stem-cell initiative.

State Controller John Chiang has asked for the Fair Political Practices Committee to look into accusations against Robert Klein, the chairman, and John Reed, a board member, of the California Institute for Regenerative Medicine (CIRM) in San Francisco. A public advocacy group has also called for both to resign after it emerged that Reed, on Klein's advice, asked the CIRM to reconsider a grant decision involving a researcher at the Burnham Institute in La Jolla.

Reed is president of the Burnham Institute and intervened after the CIRM decided to rescind a previously awarded \$638,000 grant to a researcher who was not an on-site, full-time employee of the Burnham Institute.

Klein says he now realizes that Reed should never have written the letter, and that he looks forward to the investigation. "We welcome guidance so that we can learn," he says.

Clarification

The News story 'Loopholes in oversight rules revealed' (*Nature* 450, 590; 2007) referred to a ruling issued by US Department of Energy attorneys in response to a Freedom of Information Act request. We would like to make it clear that the documents that were the subject of that request have not been released.

Endangered species cling on as rulings are overturned

The US government has revised seven decisions made by a former official who worked on the Endangered Species Act. Julie MacDonald resigned from the Fish and Wildlife Service in May after it emerged that she pressured agency scientists, and solicited advice on decisions from a friend in the online game *World of Warcraft*.

Preble's meadow jumping mouse (*Zapus hudsonius preblei*) will not now lose its listing, but will be considered threatened only in Colorado (it is also found in Wyoming). Twelve endangered species of Hawaiian picture-wing fly will be able to stretch out in 'critical habitats' larger than the 0.4 hectares per species designated for them by MacDonald. And decisions affecting several other species, including the white-tailed prairie dog (pictured) and the arroyo toad, have been deemed flawed. But research needed to revise some of these decisions will be carried out only if funding can be found.



§ 5502.105 Agency procedures.

(a) The designated agency ethics official or, with the concurrence of the designated agency ethics official, each of the separate agency components of HHS listed in § 5501.102(a) of this chapter may prescribe procedures for the submission and review of each report filed under this part. These procedures may provide for filing extensions, for good cause shown, totaling not more than 90 days.

(b) For good cause, the designated agency ethics official may extend the reporting deadlines for reports required under this part during the initial implementation phase for any reporting requirement, without regard to the 90 day maximum specified in paragraph (a) of this section.

■ 3. Amend § 5502.106 by revising paragraph (c) to read as follows:

§ 5502.106 Supplemental disclosure of prohibited financial interests applicable to employees of the Food and Drug Administration and the National Institutes of Health.

* * * * *

(c) *Report of prohibited financial interests.*—(1) *New entrant employees.* A new FDA employee, other than a public filer or a confidential filer, shall report in writing within 30 days after entering on duty with the FDA any prohibited financial interest held upon commencement of employment with the agency. A new NIH employee, other than a public filer or a confidential filer, who enters on duty at the NIH after February 3, 2005, and before September 4, 2005, shall report in writing on or before October 3, 2005, any prohibited financial interest held upon commencement of employment with the agency. A new NIH employee, other than a public filer or a confidential filer, who enters on duty at the NIH on or after September 4, 2005, shall report in writing within 30 days after entering on duty with the NIH any prohibited financial interest held upon commencement of employment with the agency.

(2) *Reassigned employees.* An employee of a separate agency component other than the FDA or of the remainder of HHS who is reassigned to a position at the FDA shall report in writing within 30 days of entering on duty with the FDA any prohibited financial interest held on the effective date of the reassignment to the agency. An employee of a separate agency component other than the NIH or of the remainder of HHS who is reassigned to a position at the NIH after February 3, 2005, and before September 4, 2005, shall report in writing on or before

October 3, 2005, any prohibited financial interest held on the effective date of the reassignment to the agency. An employee of a separate agency component other than the NIH or of the remainder of HHS who is reassigned to a position at the NIH on or after September 4, 2005, shall report in writing within 30 days of entering on duty with the NIH any prohibited financial interest held on the effective date of the reassignment to the agency.

(3) *Incumbent employees.* An incumbent employee of the FDA who acquires any prohibited financial interest shall report such interest in writing within 30 days after acquiring the financial interest. An incumbent employee of the NIH who acquires any prohibited financial interest after February 3, 2005, and before September 4, 2005, shall report such interest in writing on or before October 3, 2005. An incumbent employee of the NIH who acquires any prohibited financial interest on or after September 4, 2005, shall report such interest in writing within 30 days after acquiring the financial interest. An incumbent employee on duty at the NIH on February 3, 2005, shall report in writing on or before October 3, 2005, any prohibited financial interest held on February 3, 2005.

[FR Doc. 05-12733 Filed 6-23-05; 5 pm]

BILLING CODE 4150-03-P

DEPARTMENT OF ENERGY

10 CFR Parts 600 and 733

48 CFR Parts 935, 952 and 970

RIN 1901-AA89

Policy on Research Misconduct

AGENCY: Department of Energy.

ACTION: Notice of interim final rulemaking and opportunity for comment.

SUMMARY: The Department of Energy (DOE) is publishing an interim final general statement of policy and interim final financial assistance and procurement requirements to implement the government-wide Federal Policy on Research Misconduct. These interim final rules are designed to protect the integrity of research and development funded by DOE.

DATES: The effective date is July 28, 2005. Written comments must be received on or before the close of business August 29, 2005.

ADDRESSES: Comments (5 copies) should be addressed to: Christine Chalk, SC-5,

U.S. Department of Energy, Office of Science, Room 3H-051, 1000 Independence Avenue, SW., Washington, DC 20585.

FOR FURTHER INFORMATION CONTACT: Christine Chalk at 202-586-7203 (*Christine.Chalk@science.doe.gov*).

SUPPLEMENTARY INFORMATION:

- I. Background.
- II. Discussion of the General Statement of Policy and Standard Requirements.
- III. Public Comment Procedures.
- IV. Procedural Review Requirements.
 - A. Review Under Executive Order 12866.
 - B. Review Under Executive Order 12988.
 - C. Review Under the Regulatory Flexibility Act.
 - D. Review Under the Paperwork Reduction Act.
 - E. Review Under the National Environmental Policy Act.
 - F. Review Under Executive Order 13132.
 - G. Review Under The Unfunded Mandates Reform Act of 1995.
 - H. Review Under the Treasury and General Government Appropriations Act, 1999.
 - I. Review Under the Treasury And General Government Appropriations Act, 2001.
 - J. Review Under the Small Business Regulatory Enforcement Fairness Act.

I. Background

In 1996, the White House Office of Science and Technology Policy (OSTP) began the process of formulating a uniform government-wide Federal policy on research misconduct. OSTP published a proposed policy on research misconduct in the *Federal Register* at 64 FR 55722, October 14, 1999, and published the final policy at 65 FR 76260, December 6, 2000 (Federal Policy). The Federal Policy is available on the Office of Science Web site at <http://www.sc.doe.gov/misconduct/finalpolicy.pdf>.

The objective of the Federal Policy is to create a uniform policy framework for Federal agencies for the handling of allegations of misconduct in federally funded or supported research. Within this framework, each Federal agency funding or supporting research is expected to fashion its own regulations to accommodate the various types of research transactions in which it is engaged. This rule implements the Federal Policy for DOE including the National Nuclear Security Administration. In keeping with these objectives, these DOE regulations incorporate key aspects of the Federal Policy. In particular, research misconduct is being defined as including fabrication, falsification, or plagiarism in proposing, performing, or reviewing research, or in reporting research results, but not as including honest error or differences of opinion. In addition, a finding of research

misconduct requires a determination, based on a preponderance of the evidence, that research misconduct has occurred, including a conclusion that there has been a significant departure from accepted practices of the relevant research community and that it be knowingly, intentionally, or recklessly committed.

The core principle of the Federal Policy is that, while research organizations have the primary responsibility for the inquiry, investigation, and adjudication of allegations of research misconduct, Federal agencies have ultimate oversight authority for the research they fund or support. While there may be some overlap in the actions that may be pursued by Federal agencies and research organizations, DOE has designed this rule to assure that if an allegation of research misconduct is made against a contractor or recipient of financial assistance, either the contractor or recipient or, if appropriate, DOE, investigates that allegation. Federal law prescribes procedural frameworks for adverse contract actions, adverse assistance actions, suspensions, or debarments that are different from procedural frameworks for competing for Federal procurement or assistance awards, and for adverse personnel actions against Federal civil service employees. Further, the DOE Office of the Inspector General (OIG) may proceed under its previously existing administrative investigation process when misconduct is alleged against Federal civil service employees, contractors or recipients of financial assistance. In addition, if a contractor or financial assistance recipient cannot conduct its own research misconduct investigation the rule provides that DOE will be responsible for conducting the investigation.

In order to best implement the Federal Policy, DOE promulgates a new 10 CFR part 733 (Allegations of Research Misconduct), which sets forth a general statement of policy applicable to research conducted under a DOE contract or financial assistance agreement. Consistent with the general statement of policy, DOE today amends 10 CFR part 600 (Financial Assistance Rules), 48 CFR part 935 (Research and Development Contracting), 48 CFR part 952 (Solicitation Provisions and Contract Clauses), and 48 CFR part 970 (DOE Management and Operating Contracts). The Secretary of Energy has approved this notice for publication in the **Federal Register**. For all contracts, contracting officers must apply the DOE Acquisition Regulations (DEAR) changes (codified at 48 CFR) to

solicitations issued on or after the effective date of this rule and may, at their discretion, include these DEAR changes in solicitations issued before the effective date of this rule, provided award of the resulting contract(s) occurs on or after the effective date.

For management and operating contracts, contracting officers must apply these DEAR changes: to contracts extended in accordance with the Department's extend/compete policies and procedures (48 CFR 917.6, 48 CFR 970.1706, and internal guidance); and to options exercised under competitively awarded management and operating contracts (48 CFR 970.1706).

For management and operating contracts, contracting officers should modify existing contracts at the next fee negotiation/annual renewal after the effective date of this rule.

II. Discussion of the General Statement of Policy and Standard Requirements

Since research for DOE occurs pursuant to financial assistance agreements or contracts, the general statement of policy provides that DOE will implement the Federal Policy through the insertion in financial assistance agreements and contracts of standard requirements based on the Federal Policy. DOE expects that these standard requirements will result in most allegations of research misconduct being handled in accordance with the Federal Policy by the research institution where the research misconduct is alleged to have taken place.

The general statement of policy also sets forth guidance to DOE offices with regard to the processing of allegations of research misconduct made directly to DOE. The guidance provides for initial handling of such allegations by the DOE office programmatically responsible for an assistance agreement or contract. That office in turn will consult with the DOE Office of the Inspector General (IG) to determine whether that office will choose to investigate the allegation. If the IG declines to investigate, the DOE program office will refer the allegation to the appropriate contracting officer responsible for the administration of the assistance agreement or contract for processing by the assistance recipient or contractor consistent with requirements of the applicable research misconduct requirements. If the Department elects to act in lieu of the contractor or financial assistance recipient, the research misconduct investigation shall be conducted by the DOE office programmatically responsible for the assistance agreement or contract with

support from other departmental elements, as appropriate.

DOE is amending the DEAR at 48 CFR part 935 to prescribe the inclusion of requirements on research misconduct in all DOE contracts that involve research. DOE also is amending part 952 of the DEAR and 10 CFR part 600, respectively, to add requirements that by accepting the funds under a contract, including a management and operating contractor a financial assistance award, the recipient of DOE funds is making assurances that it has established an administrative process for reviewing, investigating, and reporting allegations of research misconduct and that it will comply with its own administrative process and the requirements of 10 CFR part 733 for review, investigation, and reporting of research misconduct. DOE also is amending part 970 of the DEAR to provide that records generated by a management and operating contractor during the course of responding to allegations of research misconduct will be considered owned by the contractor.

As suggested in the Federal Policy, DOE expects debarment and suspension would be available as possible recommended remedies for a finding of research misconduct. These remedies would exclude a person or organization from participating in research activities funded by the Federal Government. DOE's non-procurement suspension and debarment rule is promulgated at 10 CFR part 606, while the Federal procurement suspension and debarment rule is promulgated at 48 CFR part 909. Both regulations require a fact-finding process if there are any facts in dispute prior to a suspension or debarment determination. The fact-finding process used to make a determination of research misconduct under this rule would satisfy the requirements for a fact-finding hearing as adopted in the DOE's non-procurement debarment and suspension regulations, as well as the requirements for a fact-finding hearing as described in the FAR.

III. Public Comment Procedures

Interested persons are invited to participate by submitting data, views or arguments with respect to the new regulation in this rulemaking. Five copies of written comments should be submitted to the address indicated in the **ADDRESSES** section of this notice of rulemaking. All comments received will be available for public inspection as part of the administrative record on file for this rulemaking in the Department of Energy Freedom of Information Reading Room, Room 1E-090, Forrestal Building, 1000 Independence Avenue, SW., Washington, DC 20585, (202) 586-

3142, between the hours of 9 a.m. and 4 p.m., Monday through Friday, except Federal holidays. All written comments received by the date indicated in the **DATES** section of this notice of rulemaking and all other relevant information in the record will be carefully assessed and fully considered prior to the publication of the final rule. Any information or data considered to be exempt from public disclosure by law must be so identified and submitted in writing, one copy, as well as one complete copy from which the information believed to be exempt from disclosure is deleted. DOE will determine if the information or data is exempt from disclosure.

IV. Procedural Review Requirements

A. Review Under Executive Order 12866

This regulatory action has been determined to be a "significant regulatory action" under Executive Order 12866, "Regulatory Planning and Review," (58 FR 51735, October 4, 1993). Accordingly, this action was subject to review under that Executive Order by the Office of Information and Regulatory Affairs of the Office of Management and Budget (OMB). OMB has completed its review.

B. Review Under Executive Order 12988

With respect to the review of existing regulations and the promulgation of new regulations, section 3(a) of Executive Order 12988, "Civil Justice Reform," 61 FR 4729 (February 7, 1996), imposes on Executive agencies the general duty to adhere to the following requirements: (1) Eliminate drafting errors and ambiguity; (2) write regulations to minimize litigation; (3) provide a clear legal standard for affected conduct rather than a general standard; and (4) promote simplification and burden reduction. The review required by section 3(a), section 3(b) of Executive Order 12988 specifically requires that Executive agencies make every reasonable effort to ensure that the regulation: (1) Clearly specifies the preemptive effect, if any; (2) clearly specifies any effect on existing Federal law or regulation; (3) provides a clear legal standard for affected conduct while promoting simplification and burden reduction; (4) specifies the retroactive effect, if any; (5) adequately defines key terms; and (6) addresses other important issues affecting clarity and general draftsmanship under any guidelines issued by the Attorney General. Section 3(c) of Executive Order 12988 requires Executive agencies to review regulations in light of applicable standards in section 3(a) and section

3(b) to determine whether they are met or it is unreasonable to meet one or more of them. The Department has completed the required review and determined that, to the extent permitted by law, the regulations meet the relevant standards of Executive Order 12988.

C. Review Under the Regulatory Flexibility Act

The Regulatory Flexibility Act, 5 U.S.C. 601 *et seq.*, requires that a Federal agency prepare a regulatory flexibility analysis for any rule for which the agency is required to publish a general notice of rulemaking. Today's rule consists of a general statement of policy, amendments to financial assistance regulations, and amendments to procurement regulations. Each part of today's rule is exempt from the requirement to publish a general notice of proposed rulemaking under the Administrative Procedure Act (5 U.S.C. 553) or any other law. Therefore, the Regulatory Flexibility Act does not apply to this rulemaking.

D. Review Under the Paperwork Reduction Act

No new information collection requirements subject to the Paperwork Reduction Act, 44 U.S.C. 3501 *et seq.*, are imposed by today's regulatory action.

E. Review Under the National Environmental Policy Act

The Department has concluded that promulgation of this rule falls into a class of actions which would not individually or cumulatively have significant impact on the human environment, as determined by Department of Energy regulations (10 CFR part 1021, subpart D) implementing the National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. 4321 *et seq.*). Specifically, this rule is categorically excluded from NEPA review because the rule and amendments to the Department of Energy Acquisition Regulation (DEAR) would be strictly procedural (categorical exclusion A6). Therefore, this rule does not require an environmental impact statement or environmental assessment pursuant to NEPA.

F. Review Under Executive Order 13132

Executive Order 13132 (64 FR 43255, August 10, 1999) requires agencies to develop an accountable process to ensure meaningful and timely input by State and local officials in the development of regulatory policies that have "Federalism implications." As defined in the Executive Order, policies that have Federalism implications

include regulations that have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government. The Department has examined this rule and has determined that it would not have a substantial direct effect on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government. No further action is required by Executive Order 13132.

G. Review Under the Unfunded Mandates Reform Act of 1995

The Unfunded Mandates Reform Act of 1995 (Pub. L. 104-4) generally requires a Federal agency to perform a detailed assessment of costs and benefits of any rule imposing a Federal Mandate with costs to State, local or tribal governments, or to the private sector, of \$100 million or more. This rulemaking affects private sector entities, and the impact is less than \$100 million.

H. Review Under the Treasury and General Government Appropriations Act, 1999

Section 654 of the Treasury and General Government Appropriations Act, 1999 (Pub. L. 105-277) requires Federal agencies to issue a Family Policymaking Assessment for any proposed rule or policy that may affect family well-being. Today's rule does not impact on the autonomy or integrity of the family institution. Accordingly, the Department has concluded that it is not necessary to prepare a Family Policymaking Statement.

I. Review Under the Treasury and General Government Appropriations Act, 2001

The Treasury and General Government Appropriations Act, 2001 (44 U.S.C. 3516, note) provides for agencies to review most disseminations of information to the public under guidelines established by each agency pursuant to the general guideline issued by OMB. OMB's guidelines were published at 67 FR 8452 (February 22, 2002) and DOE's guidelines were published at 67 FR 62446 (October 7, 2002). DOE has reviewed today's rulemaking under the OMB and DOE guidelines and has concluded that it is consistent with applicable policies in those guidelines.

J. Review Under the Small Business Regulatory Enforcement Fairness Act

As required by 5 U.S.C. 801, DOE will report to Congress on the promulgation of today's interim final rule prior to its effective date. The report will state that the rule is not a major rule under 5 U.S.C. 804(2).

List of Subjects

10 CFR Part 600

Administrative practice and procedure.

10 CFR Part 733

Investigations, Reporting and recordkeeping requirements, Research, Science and technology, Scientists.

48 CFR Parts 935, 952, and 970

Government procurement.

Issued in Washington, DC on June 20, 2005.

Raymond L. Orbach,
Director of Science.

■ For the reasons set out in the preamble, Chapters II and III of title 10 and Chapter 9 of title 48 of the Code of Federal Regulations respectively, are to be amended as set forth below:

PART 600—FINANCIAL ASSISTANCE RULES

■ 1. The authority citation for 10 CFR part 600 continues to read as follows:

Authority: 42 U.S.C. 7101 *et seq.*; 31 U.S.C. 6301–6308; 50 U.S.C. 2401 *et seq.*, unless otherwise noted.

■ 2. Add § 600.31 to subpart A to read as follows:

§ 600.31 Research misconduct.

(a) A recipient is responsible for maintaining the integrity of research of any kind under an award from DOE including the prevention, detection, and remediation of research misconduct, and the conduct of inquiries, investigations, and adjudication of allegations of research misconduct in accordance with the requirements of this section.

(b) For purposes of this section, the following definitions are applicable:

Adjudication means a formal review of a record of investigation of alleged research misconduct to determine whether and what corrective actions and sanctions should be taken.

Fabrication means making up data or results and recording or reporting them.

Falsification means manipulating research materials, equipment, or processes, or changing or omitting data or results such that the research is not accurately represented in the research record.

Finding of Research Misconduct means a determination, based on a preponderance of the evidence, that research misconduct has occurred. Such a finding requires a conclusion that there has been a significant departure from accepted practices of the relevant research community and that it be knowingly, intentionally, or recklessly committed.

Inquiry means information gathering and initial fact-finding to determine whether an allegation or apparent instance of misconduct warrants an investigation.

Investigation means the formal examination and evaluation of the relevant facts.

Plagiarism means the appropriation of another person's ideas, processes, results, or words without giving appropriate credit.

Research means all basic, applied, and demonstration research in all fields of science, medicine, engineering, and mathematics, including, but not limited to, research in economics, education, linguistics, medicine, psychology, social sciences statistics, and research involving human subjects or animals.

Research misconduct means fabrication, falsification, or plagiarism in proposing, performing, or reviewing research, or in reporting research results, but does not include honest error or differences of opinion.

Research record means the record of all data or results that embody the facts resulting from scientists' inquiries, including, but not limited to, research proposals, laboratory records, both physical and electronic, progress reports, abstracts, theses, oral presentations, internal reports, and journal articles.

(c) Unless otherwise instructed by the contracting officer, the recipient must conduct an initial inquiry into any allegation of research misconduct. If the recipient determines that there is sufficient evidence to proceed to an investigation, it must notify the contracting officer and, unless otherwise instructed, the recipient must:

(1) Conduct an investigation to develop a complete factual record and an examination of such record leading to either a finding of research misconduct and an identification of appropriate remedies or a determination that no further action is warranted;

(2) Inform the contracting officer if an initial inquiry supports an investigation and, if requested by the contracting officer thereafter, keep the contracting officer informed of the results of the investigation and any subsequent adjudication. When an investigation is complete, the recipient will forward to

the contracting officer a copy of the evidentiary record, the investigative report, any recommendations made to the recipient's adjudicating official, and the adjudicating official's decision and notification of any corrective action taken or planned, and the subject's written response to the recommendations (if any).

(3) If the investigation leads to a finding of research misconduct, conduct an adjudication by a responsible official who was not involved in the inquiry or investigation and is separated organizationally from the element which conducted the investigation. The adjudication must include a review of the investigative record and, as warranted, a determination of appropriate corrective actions and sanctions.

(d) The Department may elect to act in lieu of the recipient in conducting an inquiry or investigation into an allegation of research misconduct if the contracting officer finds that:

(1) The research organization is not prepared to handle the allegation in a manner consistent with this section;

(2) The allegation involves an entity of sufficiently small size that it cannot reasonably conduct the inquiry;

(3) DOE involvement is necessary to ensure the public health, safety, and security, or to prevent harm to the public interest; or,

(4) The allegation involves possible criminal misconduct.

(e) DOE reserves the right to pursue such remedies and other actions as it deems appropriate, consistent with the terms and conditions of the award instrument and applicable laws and regulations. However, the recipient's good faith administration of this section and the effectiveness of its remedial actions and sanctions shall be positive considerations and shall be taken into account as mitigating factors in assessing the need for such actions. If DOE pursues any such action, it will inform the subject of the action of the outcome and any applicable appeal procedures.

(f) In conducting the activities in paragraph (c) of this section, the recipient and the Department, if it elects to conduct the inquiry or investigation, shall adhere to the following guidelines:

(1) **Safeguards for information and subjects of allegations.** The recipient shall provide safeguards to ensure that individuals may bring allegations of research misconduct made in good faith to the attention of the recipient without suffering retribution. Safeguards include: protection against retaliation; fair and objective procedures for examining and resolving allegations;

and diligence in protecting positions and reputations. The recipient shall also provide the subjects of allegations confidence that their rights are protected and that the mere filing of an allegation of research misconduct will not result in an adverse action. Safeguards include timely written notice regarding substantive allegations against them, a description of the allegation and reasonable access to any evidence submitted to support the allegation or developed in response to an allegation and notice of any findings of research misconduct.

(2) *Objectivity and expertise.* The recipient shall select individual(s) to inquire, investigate, and adjudicate allegations of research misconduct who have appropriate expertise and have no unresolved conflict of interest. The individual(s) who conducts an adjudication must not be the same individual(s) who conducted the inquiry or investigation, and must be separate organizationally from the element that conducted the inquiry or investigation.

(3) *Timeliness.* The recipient shall coordinate, inquire, investigate and adjudicate allegations of research misconduct promptly, but thoroughly. Generally, an investigation should be completed within 120 days of initiation, and adjudication should be complete within 60 days of receipt of the record of investigation.

(4) *Confidentiality.* To the extent possible, consistent with fair and thorough processing of allegations of research misconduct and applicable law and regulation, knowledge about the identity of the subjects of allegations and informants should be limited to those with a need to know.

(5) *Remediation and sanction.* If the recipient finds that research misconduct has occurred, it shall assess the seriousness of the misconduct and its impact on the research completed or in process. The recipient must take all necessary corrective actions. Such action may include but are not limited to, correcting the research record and as appropriate imposing restrictions, controls, or other parameters on research in process or to be conducted in the future. The recipient must coordinate remedial actions with the contracting officer. The recipient must also consider whether personnel sanctions are appropriate. Any such sanction must be consistent with any applicable personnel laws, policies, and procedures, and must take into account the seriousness of the misconduct and its impact, whether it was done knowingly or intentionally, and whether

it was an isolated event or pattern of conduct.

(g) By executing this agreement, the recipient provides its assurance that it has established an administrative process for performing an inquiry, mediating if possible, investigating, and reporting allegations of research misconduct; and that it will comply with its own administrative process and the requirements and definitions of 10 CFR part 733 for performing an inquiry, possible mediation, investigation and reporting of allegations of research misconduct.

(h) The recipient must insert or have inserted the substance of this section, including paragraph (g), in subawards at all tiers that involve research.

PART 733—ALLEGATIONS OF RESEARCH MISCONDUCT

■ 3. Part 733 is added to Chapter III of title 10 of the Code of Federal Regulations to read as follows:

PART 733—[ADDED]

Sec.

- 733.1 Purpose.
- 733.2 Scope.
- 733.3 Definitions.
- 733.4 Research misconduct requirements.
- 733.5 Allegations received by DOE.
- 733.6 Consultation with the DOE Office of the Inspector General.
- 733.7 Referral to the contracting officer.
- 733.8 Contracting officer procedures.

Authority: 42 U.S.C. 2201; 7254; 7256; 7101 *et seq.*; 50 U.S.C. 2401 *et seq.*

§ 733.1 Purpose.

The purpose of this part is to set forth a general statement of policy on the treatment of allegations of research misconduct consistent with Federal Policy on Research Misconduct established by the White House Office of Science and Technology Policy on December 6, 2000 (65 FR 76260–76264).

§ 733.2 Scope.

This part applies to allegations of research misconduct with regard to scientific research conducted under a Department of Energy contract or an agreement.

§ 733.3 Definitions.

The following terms used in this part are defined as follows:

Contract means an agreement primarily for the acquisition of goods or services that is subject to the Federal Acquisition Regulations (48 CFR Chapter 1) and the DOE Acquisition Regulations (48 CFR Chapter 9).

DOE means the U.S. Department of Energy (including the National Nuclear Security Administration).

DOE Element means a major division of DOE, usually headed by a Presidential appointee, which has a delegation of authority to carry out activities by entering into contracts or financial assistance agreements.

Fabrication means making up data or results and recording or reporting them.

Falsification means manipulating research materials, equipment, or processes, or changing or omitting data or results such that the research is not accurately represented in the research record.

Financial assistance agreement means an agreement the primary purpose of which is to provide appropriated funds to stimulate an activity, including but not limited to, grants and cooperative agreements pursuant to 10 CFR Part 600.

Finding of research misconduct means a determination, based on a preponderance of the evidence, that research misconduct has occurred. Such a finding requires a conclusion that there has been a significant departure from accepted practices of the relevant research community and that it be knowingly, intentionally, or recklessly committed.

Plagiarism means the appropriation of another person's ideas, processes, results, or words without giving appropriate credit.

Research means all basic, applied, and demonstration research in all fields of science, engineering, and mathematics, such as research in economics, education, linguistics, medicine, psychology, social sciences, statistics, and research involving human subjects or animals.

Research misconduct means fabrication, falsification, or plagiarism in proposing, performing, or reviewing research, or in reporting research results, but does not include honest error or differences of opinion.

Research record means the record of all data or results that embody the facts resulting from scientists' inquiries, including, but not limited to, research proposals, laboratory records, both physical and electronic, progress reports, abstracts, theses, oral presentations, internal reports, and journal articles

§ 733.4 Research misconduct requirements.

DOE intends to apply the research misconduct policy set forth in 65 FR 76260–76264 by including appropriate research misconduct requirements in contracts and financial assistance awards that make contractors and financial recipients primarily responsible for implementing the policy in dealing with allegations of research

misconduct in connection with the proposal, performance or review of research for DOE.

§ 733.5 Allegations received by DOE.

If DOE receives directly a written allegation of research misconduct with regard to research under a DOE contract or financial assistance agreement, DOE will refer the allegation for processing to the DOE Element responsible for the contract or financial assistance agreement.

§ 733.6 Consultation with the DOE Office of the Inspector General.

Upon receipt of an allegation of research misconduct, the DOE Element shall consult with the DOE Office of the Inspector General which will determine whether that office will elect to investigate the allegation.

§ 733.7 Referral to the contracting officer.

If the DOE Office of the Inspector General declines to investigate an allegation of research misconduct, the DOE Element should forward the allegation to the contracting officer responsible for administration of the contract or financial assistance agreement to which the allegation pertains.

§ 733.8 Contracting officer procedures.

Upon receipt of an allegation of research misconduct by referral under § 733.7, the contracting officer should, by notification of the contractor or financial assistance recipient:

(a) Require the contractor or the financial assistance recipient to act on the allegation consistent with the Research Misconduct requirements in the contract or financial assistance award to which the allegation pertains; or

(b) In the event the contractor or the financial assistance recipient is unable to act:

(1) Designate an appropriate DOE program to conduct an investigation to develop a complete factual record and an examination of such record leading to either a finding of research misconduct and an identification of appropriate remedies or a determination that no further action is warranted; and

(2) Make the appropriate findings consistent with the Research Misconduct requirements contained in the contract or financial assistance award, in order to act in lieu of the contractor or financial assistance recipient.

Title 48

PART 935—RESEARCH AND DEVELOPMENT CONTRACTING

■ 4. The authority citation for 48 CFR part 935 continues to read as follows:

Authority: 42 U.S.C. 7101 *et seq.*; 41 U.S.C. 418b; 50 U.S.C. 2401 *et seq.*

■ 5. Sections 935.070 and 935.071 are added to read as follows:

935.070 Research misconduct.

(a) *Applicability.* The DOE research misconduct policy set forth at 10 CFR part 733 addresses research misconduct by individuals who propose, perform or review research of any kind for the Department of Energy pursuant to a contract. The regulation applies regardless of where the research or other activity is conducted or by whom.

(b) *Definition.* Research misconduct means fabrication, falsification, or plagiarism in proposing, performing, or reviewing research, or in reporting research results. Research misconduct does not include honest error or differences of opinion. A finding of research misconduct means a determination, based on a preponderance of the evidence, that research misconduct has occurred, including a conclusion that there has been a significant departure from accepted practices of the relevant research community and that it be knowingly, intentionally, or recklessly committed.

935.071 Contract clause.

The contracting officer must insert the clause at 952.235–71, Research Misconduct, in contracts, including management and operating contracts, that involve research.

PART 952—SOLICITATION PROVISIONS AND CONTRACT CLAUSES

■ 6. The authority citation for part 952 continues to read as follows:

Authority: 42 U.S.C. 2201, 2282a, 2282b, 2282c, 7101 *et seq.*; 41 U.S.C. 418b; 50 U.S.C. 2401 *et seq.*

■ 7. Section 952.235–71 is added to read as follows:

952.235–71 Research Misconduct.

As prescribed in 48 CFR Part 935.071, insert the following clause:
Research Misconduct (JUL 2005)

(a) The contractor is responsible for maintaining the integrity of research performed pursuant to this contract award including the prevention, detection, and remediation of research misconduct as defined by this clause, and the conduct of

inquiries, investigations, and adjudication of allegations of research misconduct in accordance with the requirements of this clause.

(b) Unless otherwise instructed by the contracting officer, the contractor must conduct an initial inquiry into any allegation of research misconduct. If the contractor determines that there is sufficient evidence to proceed to an investigation, it must notify the contracting officer and, unless otherwise instructed, the contractor must:

(1) Conduct an investigation to develop a complete factual record and an examination of such record leading to either a finding of research misconduct and an identification of appropriate remedies or a determination that no further action is warranted;

(2) If the investigation leads to a finding of research misconduct, conduct an adjudication by a responsible official who was not involved in the inquiry or investigation and is separated organizationally from the element which conducted the investigation. The adjudication must include a review of the investigative record and, as warranted, a determination of appropriate corrective actions and sanctions.

(3) Inform the contracting officer if an initial inquiry supports a formal investigation and, if requested by the contracting officer thereafter, keep the contracting officer informed of the results of the investigation and any subsequent adjudication. When an investigation is complete, the contractor will forward to the contracting officer a copy of the evidentiary record, the investigative report, any recommendations made to the contractor's adjudicating official, the adjudicating official's decision and notification of any corrective action taken or planned, and the subject's written response (if any).

(c) The Department may elect to act in lieu of the contractor in conducting an inquiry or investigation into an allegation of research misconduct if the contracting officer finds that:

(1) The research organization is not prepared to handle the allegation in a manner consistent with this clause;

(2) The allegation involves an entity of sufficiently small size that it cannot reasonably conduct the inquiry;

(3) DOE involvement is necessary to ensure the public health, safety, and security, or to prevent harm to the public interest; or,

(4) The allegation involves possible criminal misconduct.

(d) In conducting the activities under paragraphs (b) and (c) of this clause, the contractor and the Department, if it elects to conduct the inquiry or investigation, shall adhere to the following guidelines:

(1) *Safeguards for information and subjects of allegations.* The contractor shall provide safeguards to ensure that individuals may bring allegations of research misconduct made in good faith to the attention of the contractor without suffering retribution. Safeguards include: protection against retaliation; fair and objective procedures for examining and resolving allegations; and diligence in protecting positions and reputations. The contractor shall also provide

the subjects of allegations confidence that their rights are protected and that the mere filing of an allegation of research misconduct will not result in an adverse action. Safeguards include timely written notice regarding substantive allegations against them, a description of the allegation and reasonable access to any evidence submitted to support the allegation or developed in response to an allegation and notice of any findings of research misconduct.

(2) *Objectivity and Expertise.* The contractor shall select individual(s) to inquire, investigate, and adjudicate allegations of research misconduct who have appropriate expertise and have no unresolved conflict of interest. The individual(s) who conducts an adjudication must not be the same individual(s) who conducted the inquiry or investigation, and must be separate organizationally from the element that conducted the inquiry or investigation.

(3) *Timeliness.* The contractor shall coordinate, inquire, investigate and adjudicate allegations of research misconduct promptly, but thoroughly. Generally, an investigation should be completed within 120 days of initiation, and adjudication should be complete within 60 days of receipt of the record of investigation.

(4) *Confidentiality.* To the extent possible, consistent with fair and thorough processing of allegations of research misconduct and applicable law and regulation, knowledge about the identity of the subjects of allegations and informants should be limited to those with a need to know.

(5) *Remediation and Sanction.* If the contractor finds that research misconduct has occurred, it shall assess the seriousness of the misconduct and its impact on the research completed or in process. The contractor must take all necessary corrective actions. Such action may include but are not limited to, correcting the research record and as appropriate imposing restrictions, controls, or other parameters on research in process or to be conducted in the future. The contractor must coordinate remedial actions with the contracting officer. The contractor must also consider whether personnel sanctions are appropriate. Any such sanction must be considered and effected consistent with any applicable personnel laws, policies, and procedures, and shall take into account the seriousness of the misconduct and its impact, whether it was done knowingly or intentionally, and whether it was an isolated event or pattern of conduct.

(e) DOE reserves the right to pursue such remedies and other actions as it deems appropriate, consistent with the terms and conditions of the award instrument and applicable laws and regulations. However, the contractor's good faith administration of this clause and the effectiveness of its remedial actions and sanctions shall be positive considerations and shall be taken into account as mitigating factors in assessing the need for such actions. If DOE pursues any such action, it will inform the subject of the action of the outcome and any applicable appeal procedures.

(f) *Definitions.*

Adjudication means a formal review of a record of investigation of alleged research

misconduct to determine whether and what corrective actions and sanctions should be taken.

Fabrication means making up data or results and recording or reporting them.

Falsification means manipulating research materials, equipment, or processes, or changing or omitting data or results such that the research is not accurately represented in the research record.

Finding of Research Misconduct means a determination, based on a preponderance of the evidence, that research misconduct has occurred. Such a finding requires a conclusion that there has been a significant departure from accepted practices of the relevant research community and that it be knowingly, intentionally, or recklessly committed.

Inquiry means information gathering and initial fact-finding to determine whether an allegation or apparent instance of misconduct warrants an investigation.

Investigation means the formal examination and evaluation of the relevant facts.

Plagiarism means the appropriation of another person's ideas, processes, results, or words without giving appropriate credit.

Research means all basic, applied, and demonstration research in all fields of science, medicine, engineering, and mathematics, including, but not limited to, research in economics, education, linguistics, medicine, psychology, social sciences statistics, and research involving human subjects or animals.

Research Misconduct means fabrication, falsification, or plagiarism in proposing, performing, or reviewing research, or in reporting research results, but does not include honest error or differences of opinion.

Research record means the record of all data or results that embody the facts resulting from scientists' inquiries, including, but not limited to, research proposals, laboratory records, both physical and electronic, progress reports, abstracts, theses, oral presentations, internal reports, and journal articles.

(g) By executing this contract, the contractor provides its assurance that it has established an administrative process for performing an inquiry, mediating if possible, or investigating, and reporting allegations of research misconduct; and that it will comply with its own administrative process and the requirements of 10 CFR part 733 for performing an inquiry, possible mediation, investigation and reporting of research misconduct.

(h) The contractor must insert or have inserted the substance of this clause, including paragraph (g), in subcontracts at all tiers that involve research.

(End of Clause)

PART 970—MANAGEMENT AND OPERATING CONTRACTS

■ 7. The authority citation for part 970 continues to read as follows:

Authority: 42 U.S.C. 2201, 2282a, 2282b, 2282c; 42 U.S.C. 7101 *et seq.*; 41 U.S.C. 418b; 50 U.S.C. 2401 *et seq.*

■ 8. Section 970.5204–3 is amended by revising paragraph (b)(1) to read as follows:

970.5204–3 Access to and ownership of records.

* * * * *

(b) * * *

(1) Employment-related records (such as worker's compensation files; employee relations records, records on salary and employee benefits; drug testing records, labor negotiation records; records on ethics, employee concerns; records generated during the course of responding to allegations of research misconduct; records generated during other employee related investigations conducted under an expectation of confidentiality; employee assistance program records; and personnel and medical/health-related records and similar files), and non-employee patient medical/health-related records, except for those records described by the contract as being maintained in Privacy Act systems of records.

* * * * *

[FR Doc. 05–12645 Filed 6–27–05; 8:45 am]

BILLING CODE 6450–01–P

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 23

[Docket No. CE227; Special Condition No. 23–169–SC]

Special Conditions: Diamond Aircraft Industries, DA–42; Diesel Cycle Engine Using Turbine (Jet) Fuel

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final special conditions; request for comments.

SUMMARY: These special conditions are issued for the Diamond Aircraft Industries (DAI) DA–42 airplane. This airplane will have a novel or unusual design feature(s) associated with the installation of a diesel cycle engine utilizing turbine (jet) fuel. The applicable airworthiness regulations do not contain adequate or appropriate safety standards for installation of this new technology engine. These special conditions contain the additional safety standards that the Administrator considers necessary to establish a level of safety equivalent to that established by the existing airworthiness standards.

DATES: The effective date of these special conditions is June 22, 2005.